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A review of the Rhinophoridae (Diptera), and a revision of the Afrotropical species

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Synopsis

The paper provides the first comprehensive account of Afrotropical Rhinophoridae, of which 10 genera and 23 species are recognized, described and keyed (including four new genera and 13 new species). The Rhinophoridae are characterized on a world basis, and the family status and generic classification of the group discussed. The small Oriental fauna is briefly reviewed and keyed. It is emphasized that there are no Afrotropical host records but that elsewhere the rhinophorids are of great biological interest because of their unique habit of parasitizing terrestrial isopods (woodlice). The taxonomic treatment includes five new generic synonyms, one new specific synonym and six new combinations.

Introduction

The family Rhinophoridae is a taxonomic waif, neglected by professional and amateur dipterists alike. This is a pity, because despite the unexciting appearance of the adult flies the family is potentially of great biological interest as it appears to contain the only Diptera known to parasitize Crustacea.* Thompson (1934), in a paper that is a classic of diptero-parasitology, definitively

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* But commensal and phoretic relationships between Diptera and Crustacea are well known, such as those between some African simuliids and river-crabs and prawns; and the unexplained but probably accidental occurrence of ephydrid-like larvae in the branchial chambers of land-crabs has been reported (Keilin, 1921).

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established that several European species of rhinophorids are parasites of woodlice (terrestrial Isopoda), and his observations have been confirmed from time to time by later authors. But only Bedding (1973), who describes the first instar larvae of some British species and their adaptations for host penetration, has added significantly to the foundation of biological knowledge laid by Thompson.

Knowledge of early stages, however, is still too inchoate to be utilized for classification, and the taxonomy of rhinophorids is still wholly dependent on the characters of adult flies. Even so, there are extremely few taxonomic works of recent years that are in any way comprehensive and all are concerned with the European fauna – because most rhinophorids are (or at least have been thought to be) Palaearctic. Most useful are Séguy's (1941) account of the western and southern European fauna, van Emden's (1954) treatment of the British species, and Herting's (1961) monograph of Palaearctic forms. The last-named work is a useful introduction to classification but is unillustrated.

For the Afrotropical Region (a term preferred to Ethiopian Region for the reasons given by Crosskey & White, in press) taxonomic information has been exceedingly scanty, and there has been no previous attempt to synthesize such information as does exist or to describe the various new taxa that are to be found scattered in collections. In offering the present work I make it clear that its genesis lies not in any longstanding acquaintance with the group, but in the purely practical need to produce an account of the fauna (describing the various new genera and species) in advance of the new catalogue of Afrotropical Diptera currently in production by this Museum. The paper has been hastily produced and in some respects falls short of the fullest revisionary standards (for instance I have not attempted to study and illustrate the male genitalia of all species and have not therefore derived all the taxonomic information possible from these structures); but it is hoped that its prime objects of providing means of identification and tolerably adequate descriptions of new taxa have been attained.

Nothing, it should be added, is known of the biology of Afrotropical species and it is by inference that it is assumed that they parasitize the rich African woodlouse fauna. In the interests of convenience I coin the vernacular term 'woodlouse-flies' for members of the Rhinophoridae.

Material and methods

This work is based primarily on a study of rhinophorid material in the collection of the British Museum (Natural History), but types and such small quantities of previously undetermined Afrotropical material as existed in other collections have been studied also. The following list shows the abbreviations used for the repositories of material seen.

AMNH	American Museum of Natural History, New York
BMNH	British Museum (Natural History), London
IRSNB	Institut Royal des Sciences Naturelles de Belgique, Brussels
MNHN	Muséum National d'Histoire Naturelle, Paris
MNHU	Museum für Naturkunde der Humboldt-Universität, Berlin
MRAC	Musée royal de l'Afrique centrale, Tervuren
NM	Naturhistorisches Museum, Vienna
NMP	Natal Museum, Pietermaritzburg
SAM	South African Museum, Cape Town
USNM	United States National Museum, Washington, D.C.
UZI	Universitetets Zoologiska Institution, Lund

Most of the terminology used in this work is shown in Figs 1–7, and comment is needed only on a few terms not covered by illustration and on the abbreviations used.

The side of the thorax is not illustrated but standard terms such as propleuron, and sternopleural, hypopleural and pteropleural setae are assumed to be familiar. Less familiar terms for lateral thoracic features are as follows: *pleurotergite* is the sclerite above the metathoracic spiracle and behind the pteropleuron (i.e. the supraspiracular convexity of Zumpt); *mediotergite* is the broad posterodorsal declivity of the thorax below the postscutellum and lower calyptrae; *infra-*

squamal hairs are minute hairs on each side of the mediotergite close to the bases of the lower calyptrae; *barette* is the small subrectangular area between pteropleuron and hypopleuron.

Positions of leg setae are indicated by the convention of imagining the leg to be extended at right-angles to the long axis of the fly, when setae can be:

a	anterior	*p*	posterior
ad	anterodorsal	*pd*	posterodorsal
av	anteroventral	*pv*	posteroventral
d	dorsal	*v*	ventral

It is important to note that *tibial setae described by any of these letters are on the shaft of the tibia and not at its end unless otherwise specified.*

Names of thoracic setae are abbreviated as follows:

acr	acrostichal	*pra*	pre-alar
dc	dorsocentral	*stpl*	sternopleural
ia	intra-alar		

When it is necessary to show whether the *acr*, *dc* or *ia* setae are in front of or behind the transverse suture (i.e. the depression separating prescutum from scutum) these abbreviations are prefixed *prst* (presutural) and *post* (postsutural) respectively. Thus *prst acr* indicates presutural acrostichal setae.

Abdominal tergites are indicated by the letter T followed by the relevant segment number. The first apparent tergite is T1+2 and the last large tergite visible from above is T5: the two intervening tergites (T3 and T4) are sometimes referred to jointly as 'intermediate abdominal tergites'.

In the wing venation cell R_5 is described as 'petiolate' if closed well before the wing edge by coalescence of veins M and R_{4+5} and connected with the wing apically by a 'petiole' of the kind shown in Fig. 18.

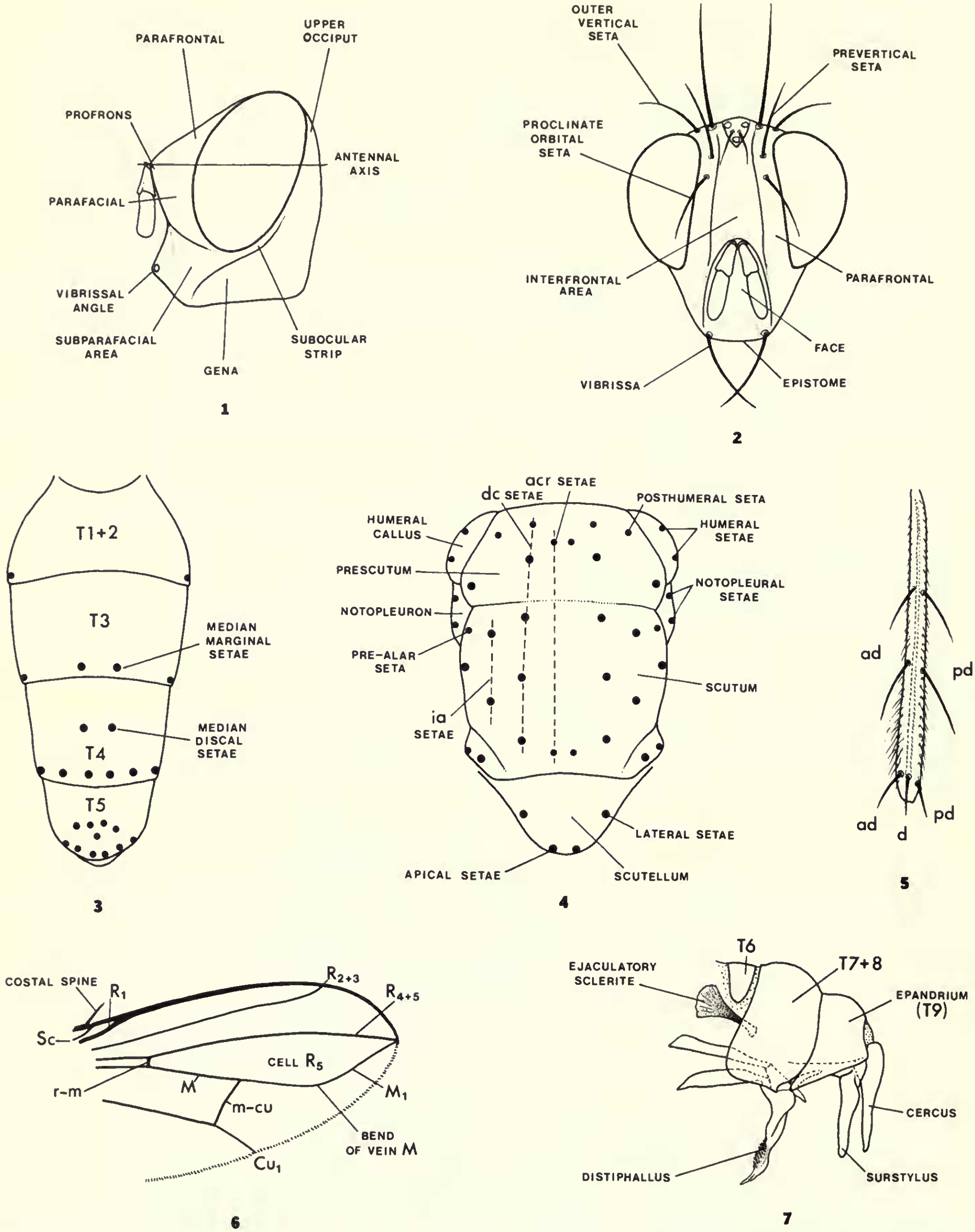
Setae bending forwards and downwards in relation to the surface on which they stand are 'proclinate' and those that bend upwards and backwards are 'reclinate'. The ultramicroscopic pubescence that accounts for so much of the pattern and general appearance is termed 'pollinosity' (dusting of some authors), and a surface bearing it is termed 'pollinose' if the pollinosity is obvious to the naked eye or at low-power microscope examination.

Finally it may be mentioned that a glossary of terms used in taxonomy of Tachinidae that is fully relevant also to Rhinophoridae has recently been published (Crosskey, 1973).

Family status and recognition

It is to Villeneuve (1924) that we owe the current taxonomic concept of the rhinophorids, for he was the first dipterist to define this suprageneric group of muscoid flies in anything like its modern sense (although there had been earlier usages of a restricted subfamily Rhinophorinae). For some fifty years now dipterists who have touched the rhinophorids have – in essence at least, and give or take a genus or two – been following Villeneuve's ideas. But there has, nevertheless, been much less agreement on how to rank the group and where to place it in relation to other calyptrate flies, though authors have been at one in placing the rhinophorids very close to the tachinids, calliphorids and sarcophagids and in regarding the exact relationships as problematical. Villeneuve ranked the group as a subfamily of Tachinidae, but used the latter name for an all-embracing muscoid family that included all the forms now regarded as composing the Calliphoridae and Sarcophagidae as well as the true Tachinidae; Villeneuve thus equated Rhinophorinae with the other subfamilies that comprised Tachinidae in his wide sense, such as Tachininae, Dexiinae, Phasiinae, Calliphorinae and Sarcophaginae (in effect giving the rhinophorines equivalent ranking to calliphorines and sarcophagines, so that if each of these were to be regarded as a family then the rhinophorines should be also).

Villeneuve's (1924) system, under which virtually all the muscoids with hypopleural setae were 'Tachinidae' and all those without were 'Anthomyidae', did not survive long in this form, and was soon almost universally supplanted by a system in which the forms with hypopleural setae were regarded as forming two (or more) families – the most commonly accepted system (and that still favoured by some dipterists) being one in which forms with hypopleural setae and a swollen postscutellum formed the Tachinidae proper and forms with hypopleural setae but



Figs 1–7 Terminology used in the text. (1) head, lateral view. (2) head, facial view. (3) abdomen, dorsal view. (4) thorax, dorsal view. (5) hind tibia, left side and dorsal view. (6) wing. (7) ♂ postabdomen, lateral view. Setae omitted from Fig. 1 and their positions indicated by black dots on Figs 3 and 4.

without a convexly swollen postscutellum formed the Calliphoridae. This is the system that was adopted, for instance, by Séguy (1941) and van Emden (1954) and that is still favoured by Zumpt (various publications). In many respects it is a sound taxonomic system, for while it can result in some anomalies that few dipterists would now approve (e.g. van Emden's inclusion of the oestroids in the phasiine Tachinidae) it does in general reflect a fundamental biological cleavage – the true Tachinidae being parasites of other insects and adapted accordingly, and the Calliphoridae, though having very varied biology, being mainly non-parasitic (although including some parasites of insects in the miltogrammine–sarcophagine line). (From the nomenclatural viewpoint, however, the Calliphoridae versus Tachinidae system is wrong, since dipterists have overlooked the fact that several family-group names have priority over Calliphoridae, for example Rhinophoridae itself dates back to 1863.)

The fitting of the rhinophorids into the two-family Tachinidae–Calliphoridae system by past authors has given rise to some discrepancies in treatment that more or less persist to the present time. The majority view has been that the woodlouse-flies should be included as a subfamily within the Calliphoridae, a view held, for example by Mesnil (1939), Séguy (1941), Hennig (1952), van Emden (1954), Zumpt (1956*a*; 1956*b*) and Herting (1957; 1961), but a few modern authors have placed them as a subfamily of Tachinidae (Sabrosky & Arnaud (1965) and Guimarães (1971), for instance, have done this but from the viewpoint of cataloguing rather than any detailed appraisal of affinities). The most recent trend, however, is to regard the woodlouse-flies as forming a small discrete family (Rhinophoridae) equivalent in rank to the Calliphoridae, Sarcophagidae and Tachinidae, this system being adopted, for instance, by Brues *et al.* (1954), Verbeke (1962), Rohdendorf (1964), Lehrer (1966) and Hennig (1973).

The ranking of supraspecific taxa cannot be objectively determined, at least by the methods of classical evolutionary taxonomy, and clearly arguments can be adduced to defend the ranking of a particular taxon only in the most subjective way. Nevertheless, I favour the view now gaining ground that the woodlouse-flies are best ranked as a full family of calyptrate flies, and the object of this section is to put forward the reasons for this view and to show how the group can be recognized and distinguished from other families of related muscoid Diptera. The arguments are confined to comparison with tachinids, calliphorids and sarcophagids (including miltogrammines) as dipterists do not dispute that these are the closest affines of the rhinophorids. (Townsend's (1935; 1938) idiosyncratic system under which the rhinophorid genera were distributed among three tribes of Melanophoridae is left out of consideration, as it cannot be equated with any modern system and no present-day dipterist takes Townsend's muscoid family classification seriously (see Townsend's *Manual of Myiology*).)

In brief, and before discussing the significant points in detail, the reasons for accepting the rhinophorids as a family may be stated thus:

(1) the group contains the only Diptera that parasitize woodlice (Crustacea : Isopoda) and is confined, or nearly so, to this group of hosts (at least, so far as present knowledge goes);

(2) the reproductive habit and first-stage larval morphology are distinctive, and taken together unique, among the muscoid flies;

(3) the adult morphology is homogeneous (excluding certain aberrant forms that may not belong) but shows characters that preclude unambiguous assignment to any one of the neighbouring families;

[Arbitrary retention of rhinophorids within Calliphoridae or Sarcophagidae or Tachinidae serves only to increase the heterogeneity of whichever family is selected as 'parent' and to make it less discretely definable.]

(4) it obviates the practical nomenclatural difficulty (persistently and unjustifiably ignored by dipterists) that the name Rhinophoridae has priority over Calliphoridae.

[Strictly, under the rules of nomenclature, the whole broad resultant family should be known as Rhinophoridae if the group is included within 'Calliphoridae' or 'Sarcophagidae'. Tachinidae as a name pre-dates Rhinophoridae and is not affected.]

With regard to the discussion that follows it must be emphasized that eggs, larvae and hosts are only known for a small proportion of species, and that it has been necessary to extrapolate assumptions from these for the family as a whole. In the discussion of adult features the aberrant genus *Bequaertiana* Curran, which may not belong, is ignored (its early stages and hosts, if indeed parasitic, are unknown).

Early stages and host relations

The first-stage larvae of Rhinophoridae are very distinctive, with specialized adaptations involved in securing a hold upon, or gaining entry through, the body-wall of the woodlouse host. A glance at Bedding's (1973) figures shows convincingly that first-stage larvae are very unlike the relatively featureless subcylindrical or fusiform first-stage maggots that are characteristic of most calliphorids, sarcophagids or tachinids. Bedding differentiates two kinds of rhinophorid first-stage larva, one in which the body segments bear complex pseudopod-like processes and another that lacks such fleshy projections but that has the posterior end modified into a complicated pad-like structure on which the larva can swivel in an erect posture. Apart from these unusual features, the larvae show a strangely warty surface combined with various arrangements of spines or strongly sclerotized scales (*Stevenia atramentaria* larva even having a long furcate process on the last segment for interlocking with the brood-pouch of the host). In addition to these external morphological features the first-stage rhinophorid larvae show some unusual modifications in the buccopharyngeal skeleton, the paired mandibular sclerites being short and deep and having two or more teeth on each, and the anterior section of the pharyngeal sclerite being extraordinarily slender and elongate. Modifications of this kind do not seem to occur, so far as I can judge from the literature, in any related groups of muscoid flies, even among Tachinidae (a family in which specialized modifications of the first-stage larva – such as its conversion to a perfect planidium – are prone to crop up).

Most commonly the first-stage larva of calliphorids, sarcophagids and tachinids is a simple maggot showing little external modification except for segmental bands of micro-spines, quite unlike the rhinophorid larva, and this holds true even for the parasitic members of the Calliphoridae and Sarcophagidae (families that are mainly non-parasitic). No members of the Calliphoridae s. str. have insect hosts, but the few that are parasitic on other invertebrates, such as the species of *Pollenia* Robineau-Desvoidy and *Onesia* Robineau-Desvoidy attacking earthworms (Keilin, 1915; Fuller, 1933) and of *Melinda* Robineau-Desvoidy parasitizing molluscs (Keilin, 1919), have rather simple musciform first-stage larvae without any of the external modifications found in rhinophorids. The same appears to be true of the first-stage larvae of parasitic Sarcophagidae (including the miltogrammines) (Thompson, 1921; Knipling, 1936). Thus it appears impossible to find any real equivalent to the rhinophorid first-stage larva even in those parasitic forms of allied groups having hosts that, seemingly, might pose similar problems in host-penetration.

Another biological aspect making the Rhinophoridae curious among parasitic forms is the fact that the highly specialized first-stage larvae are associated with an oviposition habit of great simplicity and apparent primitiveness. Rhinophorids, so far as is known, are oviparous and deposit the eggs freely away from the host. But while this in itself is not unusual in parasitic muscoids, the rhinophorids are extraordinary because they deposit soft-shelled, flexible and unincubated eggs that require to develop for several days before the larvae are ready to hatch. This habit contrasts strongly with the Tachinidae, in which (if deposition does not occur as larvae) the eggs are already fully incubated when they are laid and the embryo larvae ready for immediate emergence.

Thus the rhinophorids appear to have a uniquely distinctive biology, combining the parasitic habit on an unusual host-group with highly modified first-instar larvae emerging from eggs that incubate outside of the mother flies. Nothing quite comparable to this seems to occur in tachinids, sarcophagids and calliphorids and the biology therefore offers considerable support for according family rank to the group.

It need only be added here that egg morphology, second-stage and third-stage larvae (and therefore puparia) show no specially distinctive characters in rhinophorids that assist in determining the exact relationships, as indeed is most generally the case in the whole calliphorid–sarcophagid–rhinophorid–tachinid complex. It is noteworthy, however, that the older larvae of rhinophorids and the puparia do not have deeply sunken hind spiracles of the kind that occur in

Sarcophaginae, the posterior spiracles being borne instead very prominently and sometimes on a narrowed terminal extension of the body (Thompson, 1934).

Adult morphology

In practice the differentiation of the Rhinophoridae from the allied families (Tachinidae, Calliphoridae, Sarcophagidae) is dependent on morphological characters of the imagines, and this section is aimed at calling attention to the principal adult characters that jointly or severally support the family ranking for Rhinophoridae and at the same time assist in family recognition.

Before enumerating the essential characters, however, some comment is needed on the general problem of satisfactory differentiation of the families cited above. Most family keys existing in the literature deal with a limited geographical fauna, such as that of Britain or of one zoogeographical region, and the characters used serve more or less satisfactorily for the placement of a specimen into its rightful family or subfamily. On a world basis, though, it is a much less straightforward matter to provide simple workable keys that will unambiguously place a specimen into its correct family, because among the thousands of species comprising the vast Tachinidae–Calliphoridae–Sarcophagidae–Rhinophoridae complex are many that are highly aberrant or that show confusing mosaics of characters making them hard to fit into a particular family. The Australian fauna, for example, includes many odd and undescribed calyptrate flies for which the proper family placement is very obscure (though many will probably prove to be tachinids when their biology becomes known, despite the lack of a convexly swollen postscutellum).

The swollen postscutellum of Tachinidae is a good instance of the 'classic' key character cited over and over again as diagnostic for the family, when in fact there are many tachinids in which postscutellar swelling is absent or insignificant. Hennig (1973 : 14), for instance, uses it in the most recent comprehensive key to dipterous families. Of course, it is an extremely useful character as it is a feature of at least 95 per cent of described tachinid species. But the point is that swelling of the postscutellum is not nearly so reliable a character for recognition of the Tachinidae as the standard keys would make it appear, and many forms that are undoubtedly tachinids on all the evidence would be run down to some other family simply because they lack any pronounced swelling of the postscutellar region.

Throughout the enormous complex under discussion, but most notably in Tachinidae, there occur species showing features that obscure their real relationships and that defeat all attempts to key, and to characterize, the different families or other suprageneric taxa on just one or a small number of characters (however judiciously chosen). In Tachinidae there are even a few species (such as *Lophosiosoma bicornis* Mesnil) in which hypopleural setae are totally wanting, although presence of these setae is supposedly diagnostic for the Tachinidae–Calliphoridae–Sarcophagidae–Rhinophoridae complex (in contrast to the Muscidae and allied families in which hypopleurals are absent). Likewise there are many Tachinidae in which the mouthparts are almost completely vestigial, such forms being so like oestroids in this respect that they do not run down to Tachinidae in standard keys (e.g. that run to Gasterophilidae and Oestridae in Hennig's *op. cit.* key).

In the circumstances outlined above it cannot be expected that the Rhinophoridae can be immediately distinguished from other families by some simple character or small suite of characters, and Hennig (1973 : 14) made no attempt in his key to world Diptera families to differentiate the Calliphoridae, Sarcophagidae, Rhinophoridae and Stackelbergomyiidae from each other, even though he accepted family status for each (Hennig simply remarking 'Sichere diagnostische Merkmale zur Unterscheidung der Familien, deren Umgrenzung zum Teil auch noch unglekärt ist, können nicht angegeben werden'). In dealing here with the Rhinophoridae, however, I feel that an attempt is needed at a 'recognition couplet' that will enable the family to be differentiated reasonably concisely from the other families with which its members could be confused. The recognition couplet given below embraces the features that, taken collectively, should ensure accurate family identification for *almost* all specimens (*even with this extended set of characters there remain a very few aberrant tachinids that will more or less fit the rhinophorid characterization*).

Metathoracic spiracles with erect fringes around the openings (Figs 41–44). Postscutellum not convexly swollen or only very slightly so. Lower calpytrae small and subcircular or slightly tongue-like, widely removed from scutellum.* Propleura, prosternum, sub-alar bullae, postalar walls, pleurotergites and suprasquamal ridges bare. 2+3 dorsocentral setae. Abdominal T1+2 not excavate. ♂ abdominal sternites exposed or mainly so. Wing without M_2 appendix or fold extending from bend of *M* and with M_1 almost straight whatever its direction (i.e. not inflexed). Stem-vein bare. ♂ postabdomen with well-developed sixth tergite. Hind tibia with *ad*, *d* and *pd* preapical setae. Facial carina absent. Facial ridges without strong setae (at most with weak vestiture near vibrissae). Eyes bare **RHINOPHORIDAE**

Forms without this combination of characters present simultaneously and almost always with a distinct operculum to the metathoracic spiracle (e.g. Figs 45, 46) **CALLIPHORIDAE, SARCOPHAGIDAE, TACHINIDAE**

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* Except widened in one species.

The following comments indicate how some of the rhinophorid characters cited in the foregoing couplet have particular value in distinguishing the family.

Metathoracic spiracles

In Calliphoridae, Sarcophagidae and the great majority of Tachinidae the external opening of the metathoracic spiracle is occluded by one or a pair of complex shutters (the 'volets' of Séguy), one of which when they are paired acts as a movable flap or operculum. In Rhinophoridae, however, the external opening of the spiracle lacks a definite occluding flap or pair of flaps and instead is margined by complex short fringes that stand out from the spiracular rim (there being normally an anterior and a posterior fringe that meet ventrally but that are widely separated dorsally). The nature of the metathoracic spiracle provides the most important single character for rhinophorid recognition, and has been used by various authors in keys to the groups here discussed. Séguy (1941) and van Emden (1954), for instance, used it as a differentiating character between Rhinophorinae and Sarcophaginae. The character can easily be used in practice at low magnification, but it is difficult with the conventional entomological microscope to discern the exact structure of the spiracular fringes and very difficult to draw the spiracle satisfactorily: Séguy's (1941 : 333) drawing, though a brave attempt, is not very accurate. I am therefore including in the present paper some photographs of the rhinophorid metathoracic spiracle taken with the BMNH stereoscan microscope so that the exact conformation of the spiracular fringes can be clearly understood. Figs 41–44 shows the spiracle in four well-distinct genera of Palaearctic rhinophorids (Fig. 41, *Rhinophora lepida*; Fig. 42, *Phyto discrepans*; Fig. 43, *Stevenia atramentaria*; Fig. 44, *Melanophora roralis*). The photographs show the spiracle of the left side with approximately similar orientation (it is difficult to ensure *exactly* similar orientation) and convey very clearly the fringe morphology and the break in the fringing on the upper spiracular margin. (The photographs also hint that fringe morphology might differ significantly between genera, but it has been outside the scope of the work to pursue this.)

For comparison, stereoscan photographs are included that show the spiracle of the 'occluding operculum' type, Fig. 45 being that of a tachinid (*Peribaea orbata* (Wiedemann)) and Fig. 46 that of a calliphorid (*Phumosia lutescens* (Villeneuve)). A wide range of 'opercular' metathoracic spiracles occurs in Tachinidae–Calliphoridae–Sarcophagidae but the two shown in Figs 45 and 46 are representative of two very common types.

Unfortunately the subcircular 'fringed' spiracle of the rhinophorid type is not entirely confined to the family, and the same kind of spiracle is found here and there in the Tachinidae (e.g. in *Archiphania* Emden, *Litophasia* Girschner, *Bezzimyia* Townsend). On the other hand, the opercular type of spiracle does not occur in any rhinophorid. *Termitoloemus* Baranov (which might not be a rhinophorid) is exceptional in having the fringe replaced by a series of long strong hairs or fine setulae subcircularly arranged around the spiracular opening, and *Bequaertiana* Curran (also possibly not a rhinophorid) is extraordinary in having the metathoracic spiracle in the form of a simple large hole without any protective fringe or operculum (much as in the tachinid genus *Cinochira* Zetterstedt).

The subcircular shape of the rhinophorid hind spiracle is itself a characteristic and helpful recognition feature, as in the overwhelming majority of forms in the other families the spiracle is distinctly elongate (e.g. as in Fig. 46). A practical instance illustrates this: the unusually small black calliphorid *Phumosia currani* Zumpt & Stimie looks very rhinophorid-like on first examination, but the conspicuously elongate metathoracic spiracle shows that Rhinophoridae would be an erroneous family identification.

Lower calyptrae

These structures, the thoracic squamae of some authors, provide a very important recognition feature. They are unusually small and rounded, and Séguy (1941), van Emden (1954) and others have used them to differentiate rhinophorines from sarcophagines. They certainly provide one of the best differential characters between Rhinophoridae and Sarcophagidae–Calliphoridae (as both these families contain, with very few exceptions, forms that have broad calyptrae with rather straight hind margins) but are less exclusively useful in differentiation from Tachinidae (as small subcircular calyptrae occur in several groups of tachinids, notably in Minthoini and Palpostomatini).

Wing venation

This is of no help in reliable differentiation from Tachinidae, as this family shows the same range of venational variability, but provides helpful adjuncts to other characters for distinguishing rhinophorids from sarcophagids (including miltogrammines). In Sarcophagidae the apical part of the median vein, that is to say the section M_1 that runs from the bend of M to the wing edge, is inwardly flexed (M_1 usually springing from the 'bend' at about a right-angle and then curving again towards the wing apex so as to describe an inwardly convex arc), and there is most often a faint M_2 appendix or fold in the wing membrane extending straight from the bend. In Rhinophoridae two main types of venation occur, one in which the bend is extremely sharp and cell R_5 very long-petiolate (Figs 25, 26) and another in which the bend is widely obtuse (Figs 19–24), but both kinds of venation differ conspicuously from that found in Sarcophagidae because M_1 is straight or nearly so and an M_2 appendix or fold is absent. Occasionally the rhinophorid M_1 is slightly inwardly convex towards the apex (e.g. Fig. 21), but it never shows the sudden flexure near the bend that is characteristic of Sarcophagidae (and that is well shown by the series of illustrations of sarcophagine and miltogrammine wings in Séguy's (1941) account of the European fauna).

As an aid to the separation of certain aberrant rhinophorid-like Tachinidae from true rhinophorids it is important to note that when a long-petiolate cell R_5 occurs in Rhinophoridae it is always associated with extremely abrupt angulation of the bend of M. There are no instances of long-petiolate rhinophorid wings simultaneously showing the very open and evenly curved bend of M such as occurs in many of the genera of phasiine Tachinidae. This makes it possible to recognize certain aberrant Phasiinae in which the postscutellum is undeveloped (e.g. the genus *Litophasia*) as being true tachinids, despite their rhinophorid-like appearance.

Bare thoracic surfaces

In the Rhinophoridae the prosternum, propleura, pleurotergites, sub-alar bullae, postalar walls, supra-squamal ridges and stem-veins of the wings are all bare, and this correlation of bare surfaces is extremely helpful in reliable recognition of the family, and especially in differentiation from members of the Calliphoridae. Rhinophorids could not, of course, be confused with such groups as Ameniinae (that have the postalar walls haired), Rhiniinae (that have the stem-veins haired), Mesembrinellinae (that have the prosternum haired and an enormous metathoracic spiracle), or with such genera as *Chrysomya* Robineau-Desvoidy (sub-alar bulla haired) and *Lucilia* Robineau-Desvoidy (suprasquamal ridges haired), but in the Calliphorinae a number of forms occur that, superficially at least, could be taken to be rhinophorids. In these cases possession of hairing on one of the surfaces specified above is sufficient to contra-indicate Rhinophoridae as the correct family placement. For example, the small black calliphorine *Phumosia currani* already mentioned above in relation to the posterior spiracle is rather like a rhinophorid but has the pleurotergites long-haired, and the Australian calliphorine genus *Aphyssura* Hardy might be mistaken for a rhinophorid but has the propleura haired; in both cases elimination from the possibility of belonging to Rhinophoridae can safely be done on the presence of hairing on particular thoracic sclerites (the elimination being confirmed by other attributes). One last instance involving recognition on this basis may be mentioned. The BMNH collection contains specimens of an apparently undescribed species of the calliphorine genus *Adichosina* Villeneuve which is unusually slender for a calliphorid and might be considered a candidate for Rhinophoridae: hairing on the prosternum, however, makes this unlikely and elimination from Rhinophoridae is confirmed by the large operculate metathoracic spiracle (though the very small subcircular lower calyptrae of the species are exceedingly rhinophorid).

Head and antennal features

Rather few cephalic characters assist in family recognition, but it is noteworthy that no rhinophorids have a long series of setae or setulae up the whole height of the facial ridges as occurs in many Tachinidae. This helps to differentiate certain aberrant Tachinidae with reduced postscutellum and fringed instead of operculate metathoracic spiracles, e.g. *Bezzimyia*, from Rhinophoridae. Also no rhinophorids have a facial carina (cf. Ameniinae and many imitomyiine and prosenine Tachinidae in which a strong carina separating the antennae occurs).

In both sexes of all known Rhinophoridae the antennae are simple and parallel-sided, though sometimes very small. There are no instances of strong dilation of the third antennal segment, nor of bifurcation or fissicorn development of male antennae such as are found in various groups of Tachinidae. Hence any aberrant specimen that might be a rhinophorid but shows extreme axe-shaped development of the third antennal segment (as in some undescribed Australian forms) or other apomorphies in the structure of the antennae is more likely a tachinid.

The rhinophorid arista is often short-plumose or, more rarely, long-plumose, but when plumosity occurs it affects the whole length of the arista (though gradually and evenly becoming shorter in most cases towards the aristal tip). The kind of arista characteristic of most sarcophagines in which the basal half is long-plumose and the apical half bare does not occur in Rhinophoridae and any specimen showing this kind of arista is likely to belong in Sarcophagidae or Calliphoridae.

Characteristics of Rhinophoridae and family limits

Family **RHINOPHORIDAE** Robineau-Desvoidy

RHINOPHORIDAE Robineau-Desvoidy, 1863 : 3. Type-genus: *Rhinophora* Robineau-Desvoidy, 1830.
PHYTIDAE Robineau-Desvoidy, 1863 : 45. Type-genus: *Phyto* Robineau-Desvoidy, 1830. (PHYTOIDAE: Brauer & Bergenstamm, 1889 : 111 (43).)
MELANOPHORINI Lioy, 1864 : 68. Type-genus: *Melanophora* Meigen, 1803.
MORINIINI Townsend, 1919*b* : 546. Type-genus: *Morinia* Robineau-Desvoidy, 1830.
MELANOMYINI Townsend, 1919*b* : 548. Type-genus: *Melanomya* Rondani, 1856.
EOPHYTOINI Townsend, 1931 : 383. Type-genus: *Eophyto* Townsend, 1919 [subjective synonym of *Stevenia* Robineau-Desvoidy, 1830].
ACAMPOMINTHOINI [sic] Townsend, 1935 : 111, 253. Type-genus: *Acompomintho* Villeneuve, 1927. (ACOMPOMINTHOINI: Townsend, 1939 : 252.)
AZAISIINI Herting, 1961 : 1, 4, 33. Type-genus: *Azaisia* Villeneuve, 1939.
? STACKELBERGOMYIIDAE Rohdendorf, 1948 : 455. Type-genus: *Stackelbergomyia* Rohdendorf, 1948.

Family of Calyptrata Muscoidea s. l. with following characters (*Bequaertiana* omitted).

IMAGO. Head widely dichoptic in ♀, widely dichoptic to near-holoptic in ♂. Eyes bare. Eye facets never greatly enlarged in either sex. Ocelli present. Ocellar setae usually present and proclinate (outwardly-directed in *Oplisa* Rondani). Inner vertical setae subparallel (cruciate sometimes in *Morinia* ♀, absent *Morinia* ♂). Frontal setae well differentiated. ♀ with prevertical setae (except *Morinia*), ♂ with or without prevertical setae. ♀ with proclinate orbital setae (very rarely undifferentiated), ♂ with or without proclinate orbital setae. Lunula bare. Face non-carinate. Facial ridges without strong setae. Head vestiture black. Antennae always simple, arista varied (but never long-plumose basally and bare apically, cf. *Sarcophaga* Meigen). Palpi present. Oral cavity and proboscis almost always well developed, latter very short to longer than head-height. Acrostichal setae varied. 2+3 *dc* setae (exceptionally one *prst dc*). 0+2 *ia* setae (small *prst ia* and a third *post ia* in some specimens of *Phyto*). 2–3 humeral and 2 notopleural setae. One (inner) posthumeral seta (but a very fine outer posthumeral haphazardly occurring in *Phyto* in a position laterad of presutural seta). Presutural seta always present. Pre-alar seta varied. 1–2 *sa* setae. 2 postalar setae. Scutellum with basic plan of two pairs of marginal setae (laterals and apicals), occasionally supplemented by a pair of basal and discal setae; apical setae cruciate or strongly convergent. Propleuron bare. Prosternum bare (exceptionally with a lateral hair in *Melanomya*). Propleural and prostigmatic setae present. Sub-alar bulla bare. 2–3 *stpl* setae (except one in *Macrotarsina*). Pteropleural seta varied (but never very strong). Barette bare (except occasionally with hairs in *Phyto*). Hypopleural setae present. Pleurotergite bare. Mediotergite usually with infrasquamal hairs. Postalar wall and suprasquamal ridge bare. Postscutellum undeveloped (as Calliphoridae). Metathoracic spiracle without 'operculum', with short anterior and posterior projecting fringes of subequal size (Figs 41–44) (except in *Termitoloemus* in which fringed with long strong sparse black hairs). Posteroventral declivity of the thorax membranous medially (metathorax 'open'). Fore coxa bare on inner anterior surface. Fore tibia with *ad* setae and one *pv* seta (*very* exceptionally two *pv* or none). Mid tibia with one or more *ad* setae, two or more *p-pd* setae and a submedian *v* seta (very rarely absent). Hind coxa bare on posterodorsal surface. Hind tibia with three dorsal preapical setae (*ad*, *d*, *pd*), at least one *ad* seta and at least two *pd* setae, at least one *av* seta and never *pv* setae, usually with *pv* apical seta. Wing veins bare excluding basal node of R_{4+5} (except some *Stevenia* with R_{4+5} setulose as far as *r–m*, and except *Termitoloemus* in which R_1 and R_{4+5} finely setulose along their length); stem-vein bare. Bend of vein M without M_2 appendix or fold and section of M from bend to wing edge (M_1) not inflexed (M_1 sometimes missing and occasional specimen of *Paykullia* with very short M_2 stub). Second costal sector very short (not longer than *m–cu*), usually haired ventrally. Costal spine usually well developed. Lower calpyter small and rounded, inner margin widely divergent from scutellum (except *Angioneura acerba* (Meigen) with broad calypter), bare except for marginal fringe. Abdomen elongate, subovate or subfusiform, T1+2 not excavate to hind margin. ♂ abdomen with sternites 1–4 wholly or partially exposed (ventral ends of T1+2, T3 and T4 not meeting in mid-venter). ♂ sternite 5 bifid with large lateral lobes (except in *Paykullia*). ♂ postabdomen with sclerotized T6 and large T7+8 (latter usually partly visible in situ), paired and unfused cerci (? *Termitoloemus*) and short distiphallus. ♀ postabdomen forming a long retractile telescopic ovipositor (except short in *Melanophora* and *Paykullia*). Approximate size range: body length 3·0–11·0 mm, wing length 2·5–7·5 mm.

Early stages. *Egg:* plano-convex with fusiform outline, soft thin white shell, and hexagonally reticulate or branched longitudinal ridged sculpture; length 0·46–0·91 mm, maximum width 0·14–0·22 mm, maximum thickness 0·125–0·200 mm. *First-stage larva:* elongate-subfusiform or dorsoventrally compressed, integument warty and with sclerotized scales or tubercles or pseudopod-like processes; buccopharyngeal armature with paired mandibular sclerites, each with two or more teeth, and with extreme attenuation of anterior part of pharyngeal sclerite; metapneustic; length 0·44–1·00 mm, maximum width 0·075–0·240 mm. *Second-* and *third-stage larvae:* elongate, but of varied shape, sometimes fusiform, with virtually bare cuticle or with extensively microspinose cuticle; metapneustic or amphipneustic, posterior end of third-stage larva usually produced into a constricted cylindrical form bearing the posterior spiracles. *Puparium:* typical barrel-shaped form, posterior spiracles not recessed but borne prominently on a narrowed cylindrical extension or conical prominence, with three or four simple straight radiating slits (puparium sometimes rather flattened and arcuate in response to host's body form). [Foregoing information from Thompson (1934) and Bedding (1973).]

Host relations. Oviparous, incompletely incubated eggs deposited away from the host. Larval stages endoparasitic in woodlice (Crustacea : Isopoda) of several genera. [Several vague and unsubstantiated records in the literature of parasitism on other groups need to be discounted at present, but if *Angioneura obscura* (Townsend) is a true rhinophorid (see later discussion) then parasitism on land-snails (Mollusca) evidently occurs (Reinhard, 1929).]

Distribution. Primarily Arctogaean, a few species occurring in North America and one species as an immigrant in the Neotropical Region. *Palaearctic Region*: ranging from western Europe to Japan, northwards to British Isles and southern Scandinavia, southwards to North Africa, Mediterranean islands and Middle East; present in Canary Islands, Madeira and Azores, absent from Iceland. *Oriental Region:* poorly known, recorded only from Nepal, Ceylon (Sri Lanka), India and Formosa. *Afrotropical Region:* mainly southern and eastern Africa, but occurring also in Congo Basin and West Africa if *Bequaertiana* and *Parazamimus* are accepted as Rhinophoridae; present in Cape Verde Islands, Socotra and Comoro Islands; unknown from Madagascar, Seychelles, Réunion, Mauritius; absent from Aldabra, Ascension, St Helena, Tristan da Cunha. *Australasian Region*: unknown.

[The Australian diptero-fauna contains several undescribed genera and species of aberrant calyptrates that are difficult to place reliably to family and could be confused with Rhinophoridae. Those that I have examined appear to be aberrant Tachinidae despite the small calyptrae and the feebly developed postscutellum.]

Discussion. The family Rhinophoridae as here characterized is a small group, containing some 23 genera and about 85 species. Rohdendorf (1964 : 18) gives the number of species as 106, but this higher number is probably due to Rohdendorf accepting several names as valid that are actually synonymous and to the inclusion of some forms of doubtful taxonomic position. Except for a few atypical genera (which are possibly not rhinophorids at all) the family is moderately homogeneous and its satisfactory classification does not necessitate the recognition of any taxa ranked between generic and family level; no subfamilies or tribes are recognized. The following discussion briefly considers the tribal classification of earlier authors and the various aberrant genera that lie outside the limits of the Rhinophoridae as here treated.

Suprageneric classification. Townsend (1935; 1938) in his *Manual of Myiology* placed nearly all the genera that recent authors have regarded as Rhinophoridae in the family Melanophoridae, and divided this family into the five tribes Melanophorini, Moriniini, Eggisopsini, Acompominthoini (as Acampominthoini in error) and Villeneuviellini, of which the last two were monogeneric. This classification cannot be in any way equated with the current concept of Rhinophoridae – even though it embraced most of the rhinophorid genera – because the first three of Townsend's tribes just listed contained genera now considered to belong in the Tachinidae, Sarcophagidae or Calliphoridae (with *Vilieneuviella* Austen, the only genus of Villeneuviellini, also now being considered a calliphorid (Zumpt, 1956*a* : 130)). Hence although *Melanophora* (type-genus of Melanophoridae) is a rhinophorid, Townsend's sense of Melanophoridae is that of a taxonomic pot-pourri lacking equivalence to the present-day Rhinophoridae. (In all, Townsend's Melanophoridae included 80 nominal genera of which only 34 belong to Rhinophoridae in the current sense. The discrepancy between 34 nominal rhinophorid genera and the 23 genera here treated as valid arises from the fact that Herting (1961) has rightly synonymized many generic names of Palaearctic forms that Townsend accepted as valid.)

Townsend's tribe Acompominthoini contained only the oriental rhinophorid genus *Acompomintho*, and indicates Townsend's penchant for unnecessary tribal splitting. *Acompomintho* differs from other rhinophorids known to Townsend only in the higher than usual antennal axis and correlated features of long facial profile and long antennae (Townsend, 1935 : 111), and this was the only basis on which Townsend erected the tribe Acompominthoini. This tribe is given no validity here, as there are various intermediates occurring in rhinophorids between those with very short antennae and low antennal axis and those with the *Acompomintho* facies. It should be noted, though, that Herting (1961) was also impressed by this character and proposed the tribe Azaisiini for forms with high antennal axis, and longer-than-usual antennae, and elongate second aristal segment (including in it two genera, *Acompomintho* and *Azaisia*, the former from Formosa and the latter from Madeira). (Nomenclaturally Herting was in error to propose the name Azaisiini as Townsend's earlier name Acompominthoini was available for Herting's tribal taxon.)*

Excluded genera of uncertain taxonomic position. The calyptrate flies contain several anomalous genera that can, on present evidence, be assigned to a family only by guesswork and that cut across the conventionally accepted characters that differentiate the major families. Some of these genera have been placed in, or closely associated to, the Rhinophoridae and require comment in the light of their present exclusion from Rhinophoridae.

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* Herting did not see the genus *Azaisia* and treated it on the basis of Villeneuve's description. The holotypes of both its species, *A. obscura* Villeneuve and *A. setitarsis* Villeneuve, have been studied during the present work through the courtesy of their loan by Dr Vanschuytbroeck from IRSNB, Brussels.

Stackelbergomyia Rohdendorf. This curious genus, containing a single deserticolous species from the U.S.S.R., was described by Rohdendorf (1948) and placed by him in a new family of its own, Stackelbergomyiidae, near to the Rhinophoridae. To judge from the description this approximate placement is correct, although (contrary to the implication of the title of the paper containing the description) it is not known that *Stackelbergomyia* is parasitic. No material has been seen of *S. arenaria* Rohdendorf, and I can add nothing to what is known at first hand, but the figures suggest some resemblances that may or may not be significant. The wing of *Stackelbergomyia* (with its loss of M_1 and setulae on R_1) and the head profile, including the diminutive antennae, are extremely similar to those of the tropical African genus *Bequaertiana* (which in the present work is included, with considerable uncertainty, in the Rhinophoridae) and phyletic affinity with this genus seems possible. But the rather incrassate legs and strong leg vestiture are very different from those of typical rhinophorids and strikingly different from *Bequaertiana* (in which the legs are devoid of strong setae or long hair); on the other hand, the rather short thick legs recall those of the Indian genus *Termitoloemus* (here accepted as a rhinophorid) and the slight possibility of relationship between *Stackelbergomyia* and *Termitoloemus* exists (although not supported by the extremely different form of distiphallus in the two genera: cf. figures in original descriptions).

Shannoniella Townsend and *Bezzimyia* Townsend. Shortly after publishing his five-tribe system for the Melanophoridae in the *Manual of Myiology* Townsend (1939) added a sixth tribe, the Shannoniellini, based on a new monotypic genus (*Shannoniella*) from Brazil. In describing the new genus and tribe he compared it to Acompominthoini, monotypic for *Acompomintho*, and thereby implied that *Shannoniella* might be a rhinophorid (as *Acompomintho* certainly belongs to the Rhinophoridae). I have not seen *Shannoniella* but from description it is evidently close to the New World genus *Bezzimyia* Townsend, of which (through the courtesy of Dr Sabrosky) I have seen material from North America. *Bezzimyia* was placed by Townsend in the Melanophorini and by Sabrosky & Arnaud (1965) in the Rhinophorinae, but Guimarães (1971 : 112) has placed *Bezzimyia* together with *Shannoniella* in the tribe Shannoniellini and has assigned this tribe to the Tachinidae near to the Minthoini. From my own examination of *Bezzimyia* during the present work I have formed the same opinion as Guimarães, and consider him to be right in removing *Bezzimyia* from the rhinophorids and treating it as a minthoine-like tachinid. The head facies with greatly enlarged and densely setulose facial ridges is conspicuously tachinid, and the enlarged fore tarsi of the female are of the minthoine type, but the postscutellum is undeveloped. Hosts are unknown for both *Bezzimyia* and *Shannoniella*.

Opsodexia Townsend. This genus is excluded here from the Rhinophoridae, as I believe its affinities to be almost certainly with the Calliphoridae, although Downes (1965) has sunk the taxon to subgeneric status within *Melanomya* (a genus belonging to the Rhinophoridae in most dipterists' opinion although treated as forming a monogeneric tribe, the Melanomyini, by Downes). I am doubtful whether Downes is justified in synonymizing *Opsodexia* (and in turn its own synonyms, *Phalacrodexia* Townsend and *Opelodexia* Reinhard) with *Melanomya* and consider the synonymy insufficiently substantiated to accept here. Thus, following Herting (1961), I treat *Melanomya* as a genus of Rhinophoridae, but regard *Opsodexia* as a genus of Calliphoridae. *Opsodexia* is a small North American genus with a conspicuously calliphorid-like head (including long plumosity on the arista that is unlike that of rhinophorids but similar to that of many calliphorids) and with haired propleuron and prosternum. The character of hairing on both propleuron and prosternum is specially noteworthy, as the propleuron is bare in all Rhinophoridae (whereas it is very commonly haired in Calliphoridae) and the prosternum is bare in Rhinophoridae except for the very occasional adventitious hair in isolated specimens of *Melanomya*.

Villanovia Strobl. Townsend (1938 : 241) thought that this genus, which he had not seen, was probably synonymous with *Tromodesia*. If so, it would belong in the Rhinophoridae. Herting, however, has recently seen the type of the type-species of *Villanovia*, namely *Phyto aperta* Strobl, and has found that it is a specimen of *Billaea villicornis* (Zetterstedt) and therefore belongs in the Tachinidae (see Morge, 1974 : 295).

Catharosia Rondani, *Cinochira* Zetterstedt, *Litophasia* Girschner. These genera have from time to time been placed in the rhinophorines (e.g. van Emden (1954), dealing with the British fauna, put *Cinochira* and *Litophasia* in Rhinophorinae) but it is now well established and accepted that they are phasiine Tachinidae. They are not considered further here, except to note that an undescribed species of *Litophasia* (a genus not previously recorded from the Afrotropical Region) occurs in South Africa.

Included genera possibly not Rhinophoridae. The genera *Termitoloemus*, *Parazamimus* and *Bequaertiana* are inadequately known to be placed reliably to family but are here accepted as Rhinophoridae. They are discussed more fully elsewhere in this work. Only *Melanomya* and *Angioneura* require comment here. These genera are regarded as distinct by Herting (1961), who treats them as rhinophorids (as have earlier workers such as Villeneuve, Séguy and van Emden), but Downes (1965) takes a quite different view and treats *Angioneura* as a subgenus of *Melanomya* and the latter as constituting the tribe Melanomyini in Calliphoridae. Downes does not comment on the rhinophorids, but remarks that 'Although members of this group [Melanomyini] have also been placed in the Sarcophagidae or Tachinidae, a better case can be made for assigning them to the Calliphoridae'. The case is not made clear because of lack of space in a catalogue entry, but is evidently based on the fact (still poorly attested and under-referenced in the literature) that some *Melanomya* (sensu Downes) species in North America are parasitic on snails (in the manner of certain calliphorids, instead of on woodlice as in rhinophorids). Unfortunately there seem to be no host records for *Melanomya* and *Angioneura* in Europe, at least Herting (1961) gives none and I have not come upon any (but have not made an exhaustive literature search). Hence there is still uncertainty as to whether true *Melanomya* and *Angioneura* (both based on European type-species, although the New World species assigned to the latter by Downes appear to be correctly associated in the same taxon) are rhinophorids on the basis of host-relations; but at least they appear to be so on the basis of their adult morphology. On this account I follow Herting and continue to consider them as Rhinophoridae.

INVENTORY OF RHINOPHORID GENERA. To conclude this Section I give below an alphabetical inventory of the genera that I accept on present evidence as constituting the family Rhinophoridae, with an indication of the number of species in each genus and their zoogeographical provenance.

Acompomintho Villeneuve, 1927 [1 species, Oriental]
  Wagneriopsis Townsend, 1927
Angioneura Brauer & Bergenstamm, 1893 [3 species, Palaearctic; 5 species, Nearctic]
  Opelousia Townsend, 1919
  Angioneurilla Villeneuve, 1924
  Opsodexiopsis Townsend, 1935
Azaisia Villeneuve, 1939 [2 species, Palaearctic]
  Azaisiella Villeneuve, 1939
Bequaertiana Curran, 1929 [2 species, Afrotropical]
Cirillia Rondani, 1856 [1 species, Palaearctic]
  Kockia Robineau-Desvoidy, 1863
Comoromyia gen. n. [1 species, Afrotropical]
Macrotarsina Schiner, 1857 [1 species, Palaearctic]
  Zelleria Egger, 1856, preocc.
  Braueria Schiner, 1861
Melanomya Rondani, 1856 [1 species, Palaearctic]
Melanomyoides gen. n. [1 species, Afrotropical]
Melanophora Meigen, 1803 [1 species, widespread]
  Illigeria Robineau-Desvoidy, 1830
Morinia Robineau-Desvoidy, 1830 [2 species, Palaearctic]
  Calobataemyia Macquart, 1855
  Anthracomya Rondani, 1856
  Disticheria Enderlein, 1934
Oplisa Rondani, 1862 [3 species, Palaearctic]
  Melanomelia Strobl, 1899
  Anoplisa Herting, 1961
Parazamimus Verbeke, 1962 [1 species, Afrotropical]
Paykullia Robineau-Desvoidy, 1830 [8 species, Palaearctic]
  Chaetostevenia Brauer, 1895
  Parafeburia Townsend, 1933
  Euplesina Wainwright, 1933
Phyto Robineau-Desvoidy, 1830 [12 species, Palaearctic; 5 species, Afrotropical]
  Savia Rondani, 1861
  Metopisena Rondani, 1862
  Semitachina Portschinsky, 1883
  Paramorinia Brauer & Bergenstamm, 1891
  Styloneuria Brauer & Bergenstamm, 1891
  Britea Curran, 1927 **syn. n.**

  - *Protachaeta* Enderlein, 1936
- ***Queximyia*** gen. n. [1 species, Afrotropical]
- ***Rhinomorinia*** Brauer & Bergenstamm, 1889 [2 species, Palaearctic; 1 species, Oriental; 9 species, Afrotropical]
  - *Oxytachina* Brauer & Bergenstamm, 1891 **syn. n.**
  - *Pseudophania* Brauer & Bergenstamm, 1893 **syn. n.**
  - *Dewetia* Bischof, 1904 **syn. n.**
- ***Rhinophora*** Robineau-Desvoidy, 1830 [1 species, Palaearctic]
- ***Stevenia*** Robineau-Desvoidy, 1830 [13 species, Palaearctic; 1 species, Oriental; 1 species, Afrotropical]
  - *Ptilocheta* Rondani, 1857
  - *Trisoneura* Lioy, 1864
  - *Eophyto* Townsend, 1919 **syn. n.**
  - *Ptiloceroides* Villeneuve, 1924
- ***Termitoloemus*** Baranov, 1936 [1 species, Oriental]
- ***Tricogena*** Rondani, 1856 [1 species, Palaearctic]
  - *Talmonia* Robineau-Desvoidy, 1863
  - *Frauenfeldia* Egger, 1865
- ***Tromodesia*** Rondani, 1856 [1 species, Palaearctic]*
- ***Ventrops*** gen. n. [1 species, Afrotropical]

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* No material of *Tromodesia* is in BMNH collection and this is the only genus in the foregoing list which has not been seen.

Taxonomic characters and generic classification

The Rhinophoridae, except for a few distinctive species, are hard to classify into clear-cut genera and the characters that should be used for generic definition are far from clear. Although the early stages are known for a few Palaearctic species the information from eggs and larvae is still too fragmentary to be embodied in a classification that takes account of all stages in the life-history. It is already obvious, however, that an harmonious generic classification based on all stages will be hard to achieve, because there are major incongruities between how species group on the adult stage and how they group in the early stages – and even between groupings based on eggs and groupings based on first-instar larvae. Bedding (1973), for example, has shown that *Phyto melanocephala* (Meigen) and *Phyto discrepans* Pandellé have the same kind of egg (with longitudinal ridges instead of the hexagonal reticulation found in other known rhinophorid eggs) but that they have conspicuously different first-stage larvae – which are at least as distinct from each other as either is from the first-stage larva of *Melanophora roralis* or of *Paykullia maculata* (Fallén); Bedding concludes from this that *melanocephala* and *discrepans* should not be congeneric despite the very similar adults, though he does not make clear why differences in first-instar larvae should necessarily be given more taxonomic weight than resemblances in eggs and adults.

Lacking sufficient knowledge of juvenile stages the generic classification must still be based on adult flies alone, and the object of this section is to call attention to the features of adult morphology that appear to have taxonomic value – especially at generic level, but to some extent at species level also. In doing so it is useful, as a standard of comparison, to refer to the monograph of Herting (1961) on Palaearctic rhinophorids, as the major part of the known rhinophorid fauna occurs in the Palaearctic area, and Herting's work is the only recent one of significance in classification.

Herting includes the 51 generically placed Palaearctic species in 15 genera, and this small ratio (3·4 species per genus) is reminiscent of the situation in Tachinidae where all classifications recognize a rather large number of (on average) small genera. In this work on Afrotropical forms I place the 23 species in ten genera, but these figures include two species that are essentially Palaearctic elements that just reach into the northern fringe of the Afrotropical Region (viz. *Melanophora roralis* in Cape Verde Islands and a new species of *Stevenia* in Socotra); omitting these two species and considering the Afrotropical fauna proper there are 21 species in eight genera, a ratio approximating to that of Herting for the Palaearctic fauna. In general, therefore, the entities that I recognize as genera for the Afrotropical fauna are closely in balance with Herting's classification, and we both recognize character gaps between genera of about the same scale – and both accept several genera as being monospecific on present evidence (seven Palaearctic and six Afrotropical). In the case of the Afrotropical Region, however, it is virtually certain that more species remain to be discovered, and this is likely to make the genus–species ratio even more comparable to the current treatment of Palaearctic forms. In the long term, though, it is likely that today's generic concepts will be considered too restrictive and that more complete knowledge of biology will render broader genera desirable.

The following account of taxonomic characters is based on a general study of the Rhinophoridae in the BMNH collection and on other material seen for this work.

Head characters

Evolutionary differentiation has evidently affected the rhinophorid head more profoundly than any other part of the external adult morphology (though this cannot be seen as in any way adaptive to what is known of the biology). The head shape provides one of the most important clues for the aggregation of species into genera, and some genera have extremely characteristic head profiles (see Figs 8–17). The features that account for the various shapes are, particularly, the degree of prominence or of recessiveness of the vibrissal angles (and epistome) and the associated concavity of the facial profile, the eye form and depth of the gena, the ventral outline of the head, and the height of the antennal axis in relation to the eye. All these provide useful generic characters. Forms with a high antennal axis (*Queximyia*, *Acompomintho*) usually have long antennae and a long straight facial profile with the vibrissae inserted almost at the lowest point of the head. Many forms (*Phyto*, *Rhinomorinia*, *Rhinophora*, *Oplisa*, *Melanomyoides*) have a characteristic anteroventral angulation of the head (e.g. Figs 8–10, 12, 16) and the vibrissae inserted on prominent vibrissal angles well above the lowermost point of the head, the genera involved evidently forming a phyletically close-knit group (which could perhaps be legitimately merged into one genus). An exceptional head shape occurs in *Ventrops* (Fig. 13) in which the eye-profile is excavate posteriorly and the gena reduced to a very narrow strip (nothing comparable occurs elsewhere in the family).

Degree of separation of the male eyes varies interspecifically but in itself is not significant for generic definition. In some genera (*Phyto*, *Rhinomorinia*) very closely related species may differ widely in male frons width, and since the near-holoptic condition is associated with loss of prevertical and proclinate orbital setae in males it is the case that presence or absence of these setae is not necessarily of generic significance. The most important character of head chaetotaxy is presence or absence of strong setae (as distinct from hairing) on the parafacials, and presence of parafacial setae is one of the significant diagnostic characters for several genera (*Stevenia*, *Tricogena*, *Cirillia*, *Acompomintho*) (Fig. 15). The antennae, palpi and proboscis are of little use for generic classification (though the proboscis can be unusually elongate in some species: Figs 9, 11), but the arista has some value. In most forms the arista is thickened only near the base and has both basal segments extremely short, but a very few forms have the arista thickened for over half its length and the second aristal segment conspicuously elongate (*Azaisia*, *Acompomintho*).

Thoracic characters

The most important character of the thorax at generic level appears to be the pre-alar seta, and Herting's (1961) generic key uses the size of this seta (whether strong or absent to very weak) to differentiate groups of genera. In working the Afrotropical fauna I have found that this seta is similarly important and that its size assists in the delimitation of genera. It is largely on the basis of this seta that I differentiate *Phyto* (*pra* seta very strong) from *Rhinomorinia* (*pra* seta very weak or absent), genera which are very close to each other in head shape, male terminalia and chaetotaxy generally and difficult to distinguish if the pre-alar seta is not considered. Other setae of the chaetotaxy, and non-chaetotactic characters, of the thorax are of limited taxonomic value.

Leg characters

Herting (1961) writes that 'Die Chätotaxie der Beine, speziell der Tibien, ist systematisch wichtig' but in the main this is true at specific level rather than generic, although number of *av* setae on the hind tibia (one or two) and of *ad* setae on the mid tibia has some limited usefulness. In general the leg chaetotaxy is extremely stable throughout the rhinophorids (almost all forms having *ad* setae and one *pv* seta on the fore tibia, two *p* and a *pv* seta plus a *v* seta on the mid tibia, and two *ad* and two *pd* setae on the hind tibia). A rather unusual character in some species is the occurrence of setae on the *posterodorsal* surface of the fore tibia (a position in which setae virtually never occur in tachinids), but this is of specific and not generic value; *pd* setae on the shaft of the fore tibia are less usual in the Afrotropical forms than in Palaearctic forms, but occur in *Stevenia socotrensis* and *Rhinomorinia setitibia.*

Wing characters

The wings offer some useful characters for generic classification, particularly in the petiolation of cell R_5 and the angulation of vein M. It is clear that whether cell R_5 is just open at the wing edge or just closed or very short-petiolate is of no significance generically and often not specifically; but the presence of a really *long* petiole (i.e. a petiole about as long as *m–cu* or longer) – which is normally associated with extremely abrupt flexing of M (at about 110–120°) – in contrast to no petiole can justifiably be used as a good generic character (cf. Figs 25, 26 with Figs 20–24). Size of the costal spine, extent of setulae on the base of R_{4+5}, obliquity of *m–cu*, position of *m–cu* in relation to *r–m*, etc. all have some taxonomic use at specific level but very little at generic. In some instances the vein-plan is so distinctive that the genus can be instantly recognized from a figure (e.g. *Melanophora*, Fig. 25). The hairing of the underside of the second costal sector (a character of considerable taxonomic value in Tachinidae) has been examined throughout the Rhinophoridae but has not been found useful; typically rhinophorids have this sector finely haired, but the hairing is often sparse or haphazardly present and sometimes absent.

Abdominal characters

Preabdominal structure is very uniform and offers no characters, but the chaetotaxy of T1+2 (presence or absence of median marginal setae), T3 (presence or absence of median marginals or discal setae) and T4 (presence or absence of median discal setae) can be useful at specific, and to some extent generic, level. The fifth sternite of the male is bifid with simple lateral lobes (often extremely large and downwardly prominent) but is of no value generically (except to the extent that *Paykullia* differs from other genera by having a simple transverse plate-like St5 lacking a median incision). The male hypopygium offers extremely useful characters at specific level in the form of the cerci and surstyli, and probably also the distiphallus and other phallic structures, but a more critical study is needed than I have been able to give here for determining whether the genitalia offer good generic differences. There is variation in the size and bristling of the epandrium (T9), T7+8 and T6, but it is doubtful whether this is of more than specific significance. Specially interesting, however, is the structure of the ejaculatory sclerite, which in *Oplisa* attains a gigantic size and reaches well forwards into the preabdomen as a large oval plate (weakly sclerotized anteriorly) (Fig. 40) and which at its base within the postabdomen is articulated to a strongly sclerotized broken annulus. This type of ejaculatory sclerite is very different from the small or medium-sized slightly clubbed or fan-shaped sclerite that is found in the other genera for which I have examined the ejaculatory sclerite (*Phyto*, *Rhinomorinia*, *Melanomya*, *Melanomyoides*, *Melanophora*, *Stevenia*, *Angioneura*, *Termitoloemus*). This character, and the detailed structure of the phallus, might re-pay further study and shed more light than we have at present on generic and specific affinities.

The female postabdomen has not been investigated for this paper, but is of the normal long telescopic type in all the Afrotropical forms in which it can be seen in situ on specimens. Herting (1961) notes that only *Melanophora* and *Paykullia* (syn. *Chaetostevenia*) in the Palaearctic fauna have a short non-telescopic postabdomen. It is not yet clear whether valuable characters exist in the female terminalia, but from examination of projecting ovipositors on museum specimens it seems very unlikely that they do at generic level in the telescopic-postabdomen forms.

Systematic treatment of the Afrotropical fauna

Composition and distribution of the fauna

Because of the extreme paucity of material in Museum collections the Afrotropical rhinophorids have been very poorly known, and prior to the present revision only 10 nominal species belonging to the group had been described from Africa south of the Sahara. Up to now these species have remained virtually unstudied, and not amalgamated into the present-day concept of Rhinophoridae (or Rhinophorinae). However, the fauna is much richer than a previous knowledge of a mere 10 species would suggest, and from assembly of material for the present study it has been possible to describe a further 13 new species (four of which require new genera because of the impossibility of assigning them convincingly to pre-existing genera). Even so it is more or less certain that only a small part of the actual rhinophorid fauna of Africa has yet been discovered, and I anticipate that when more fully worked out the Afrotropical fauna will be as rich as that of the Palaearctic Region (which at present numbers about 50 species). This paper is therefore only a beginning.

Of the 23 species here recognized in the Afrotropical Region all but one are endemic, the outsider being *Melanophora roralis* which is widespread in the Holarctic Regions and only just extends its range into the Afrotropical area (being present in the Cape Verde Islands). Despite the high degree of species-endemicity the general affinities of the Afrotropical fauna lie closely with the Palaearctic fauna, and four of the 10 genera here recognized in the Afrotropical fauna are common to both regions – and the four new genera are not fundamentally disjunct from the Palaearctic fauna (although there is no real equivalent in that fauna to the new southern African genus *Ventrops*).

The distribution of Afrotropical rhinophorids on the mainland of Africa seems (judging from the very limited material) to be centred on the temperate or subtropical parts of southern and eastern Africa, and the known fauna is much richer in South Africa than elsewhere. But assuming that the genera *Bequaertiana* and *Parazamimus* Verbeke are truly rhinophorids (as discussed elsewhere in this work) then the family is represented also in the tropical rain-forests of the Congo Basin and West Africa. These genera, however, are aberrant and strongly disjunct from other Rhinophoridae and normal forms that are unequivocally rhinophorids occur mainly in an arc from Namibia through South Africa, Mozambique and Rhodesia to Kenya (but so far without records from Tanzania).

Distribution on the peri-African islands is poorly known, but (as mentioned) *Melanophora roralis* occurs in the Cape Verde Islands, a species of *Stevenia* in Socotra and a species of the new genus *Comoromyia* in the Comoro Islands. In the islands associated with Palaearctic Africa a species of *Phyto* is found in the Canary Islands and two endemic species of *Azaisia* in Madeira (Villeneuve, 1939). Rhinophorids are almost certainly unrepresented in the well-collected islands such as St Helena, Seychelles, Aldabra and Mauritius, but probably occur in Madagascar (as there is at least one species in the Comoros). (Though scarcely relevant to Africa, the occurrence of one rhinophorid in the Azores may be noted, viz. *M. roralis* already mentioned in reference to the Cape Verde Islands).

There are no host records for Afrotropical Rhinophoridae but it can reasonably be assumed provisionally that they parasitize terrestrial Isopoda like the woodlouse-flies of other zoogeographical regions (although the possibility of parasitization of other arthropod groups such as the large African millipedes cannot be ruled out). The woodlouse fauna of the Afrotropical Region is extremely rich both in the tropical and the temperate parts of continental Africa, and woodlice are present also in the peri-African islands, and lack of suitable hosts is unlikely to be a factor limiting the distribution of African rhinophorids. The biology of Afrotropical woodlouse-flies offers an interesting field of investigation, particularly in South Africa where enquiry into the biology of relatively common coastal dune species such as *Rhinomorinia xanthocephala* should present little difficulty.

Key to genera

1 Wing with M_1 missing, cell R_5 therefore largely open posteriorly and venation without a 'bend' of vein M (Fig. 28). Intra-alar and posthumeral setae absent. Tibiae without clearly differentiated setae. Abdomen of ♂ [♀ not known] with thick and uniform covering of brilliant silver pollinosity. [West Africa to Uganda, forests] . . . ***BEQUAERTIANA*** Curran (p. 53)

– Wing with M_1 present, cell R_5 closed posteriorly and venation with a 'bend' of vein M. Intra-alar and posthumeral setae present. Tibiae with some or many clearly differentiated setae. Abdomen not so. 2

2 Wing with cell R_5 *very* long-petiolate (the petiole about as long as or longer than *m–cu*) and with the bend of vein *M* very strongly abrupt (changing direction at 110–120°) (Figs 18, 25, 26). [Insular species] 3

– Wing with cell R_5 open, closed at wing edge, or short-petiolate and with the bend of *M* widely obtuse (changing direction at about 140°) (Figs 19–24). [Continental species] . . . 5

3 Pre-alar seta very strong (larger than the notopleural setae). T1 + 2 without median marginal setae. Thorax uniformly covered with ashy grey pollinosity. Wing venation as Fig. 18. Abdominal ground colour tawny reddish yellow to reddish brown. [Comoro Islands] ***COMOROMYIA*** gen. n. (p. 46)

– Pre-alar seta absent or hair-like. T1 + 2 with median marginal setae. Thorax blackish without uniform covering of pale pollinosity. Wing venation not as Fig. 18. Abdominal ground colour black. [Not from Comoro Islands] 4

4 Parafacials with strong proclinate setae, head profile as Fig. 15. Intermediate abdominal tergites with discal setae. Wing venation as Fig. 26. Mid tibia with two *ad* setae. [Socotra] ***STEVENIA*** Robineau-Desvoidy (p. 48)

– Parafacials without setae, head profile as Fig. 17. Intermediate abdominal tergites without discal setae. Wing venation as Fig. 25. Mid tibia with one very small *ad* seta. [Cape Verde Islands] . . . . ***MELANOPHORA*** Meigen (p. 50)

5 Pre-alar seta strong (as large as or larger than the notopleural setae) 6

– Pre-alar seta absent or extremely weak (if present then always *much* weaker than the notopleural setae) 7

6 Legs and all thoracic and abdominal ground colour blackish; palpi blackish brown. Epistome weakly to strongly warped forwards from the face, facial profile therefore distinctly concave (Figs 11, 16); vibrissal angles conspicuously above the lowermost point of the head. Antennae small or medium-sized, not reaching the epistome. Presutural *acr* setae present. Intermediate abdominal tergites with or without discal setae. [East Africa and South Africa] ***PHYTO*** Robineau-Desvoidy (p. 39)

– Legs (except tarsi) and lateral parts of thorax and abdomen reddish yellow; palpi yellow. Epistome in the plane of the face, facial profile therefore almost straight (Fig. 14); vibrissal angles about at lowermost point of the head. Antennae very long, more or less reaching the epistome (Fig. 14). Presutural *acr* setae absent. Intermediate abdominal tergites each with a pair of median discal setae. [South Africa] . . . . ***QUEXIMYIA*** gen. n. (p. 45)

7 Head profile as Fig. 30; antennae extremely small, their length less than the depth of the gena. Legs and thoracic ground colour reddish yellow. Intra-alar setae standing very close to each other, anterior one much closer to posterior one than to transverse suture [? constant, only one specimen known]. Costa with unusually dense vestiture of long hairing in which spiniform macrotrichia not clearly differentiated. [Zaire] . . ***PARAZAMIMUS*** Verbeke (p. 51)

– Head profile not as Fig. 30; antennae medium-sized, their length greater than the depth of the gena. Legs and thoracic ground colour black or blackish brown. Intra-alar setae standing far apart, anterior one much closer to transverse suture than to posterior one. Costa normal, with strong spiniform macrotrichia along most of length as well as some hairing . . . 8

8 Eye in profile very large and reniform, occupying almost the whole side of the head and gena correspondingly reduced (genal depth less than width of third antennal segment, Fig. 13). Epistome about in the plane of the face. Vibrissal angles very weakly differentiated, *much* less prominent than the profrons, vibrissae inserted at a level above lowermost point of the *eye*. Parafacials invisible or almost so in profile (Fig. 13). Costal spine undifferentiated. Presutural *acr* setae absent. Halteres black. [eastern and southern Africa] ***VENTROPS*** gen. n. (p. 20)

– Eye in profile subovate or subcircular, not concave on hind margin and not occupying almost the whole side of the head (genal depth conspicuously greater than width of third antennal segment, Figs 8–10, 12). Epistome strongly warped forwards from the face. Vibrissal angles strongly differentiated, about as prominent as or more prominent than the profrons, vibrissae inserted a little below lowermost point of the eye. Parafacials visible in profile (Figs 8–10, 12). Costal spine strong. Presutural *acr* setae usually well defined. Halteres yellow. [southern Africa] 9

9 Wing cell R_5 with a petiole that is about one and a half times as long as *r–m* (Fig. 19). Scutellum with the lateral setae inserted much closer to the base than to the apical setae. Prescutum and scutum entirely without pale-pollinose vittae. Hind tibia with one *av* seta (exceptionally accompanied by an additional setula). Palpi very small (shorter than third antennal seg-

ment). ♂ head almost holoptic, frons without prevertical setae. ♂ genitalia with extremely large surstyli of cordate shape (Fig. 33) . . . . . ***MELANOMYOIDES*** gen. n. (p. 23)

– Wing with cell R_5 usually closed at the margin or very narrowly open (except in *setitibia* with *very* short petiole about half as long as *r–m*) (usually much as Fig. 22). Scutellum with the lateral setae inserted equidistantly between the base and the apical setae, or (in *xanthocephala*) closer to the apical setae. Prescutum or both prescutum and scutum with a pair of pale-pollinose (silvery or greyish) vittae (indefinite in *verticalis*). Hind tibia with two *av* setae. Palpi normal (at least as long as third antennal segment). ♂ head not almost holoptic and with prevertical setae (except in *capensis*). ♂ genitalia with elongate and often extremely narrow surstyli [not examined for all species] ***RHINOMORINIA*** Brauer & Bergenstamm (p. 25)

Genus *VENTROPS* gen. n.

Type-species: *Ventrops milichioides* sp. n.

Diagnosis. Head profile as Fig. 13. Eyes occupying almost all the side of the head and subreniform in outline (conspicuously concave on hind margin); gena correspondingly reduced, its depth less than the antennal width. Epistome in plane of the face or almost so, facial profile not concave. Vibrissal angle recessive, vibrissae inserted well above the lowermost point of the eye. Eyes of ♂ not approximated, frons equibroad in both sexes. ♂ with proclinate orbital setae, prevertical setae and small outer vertical setae as in ♀. Parafacials very narrow, invisible or almost so in profile, bare or with a few minute hairs at upper end. Antennae short, antennal axis below eye middle, antennal apices falling short of the epistome; arista long-pubescent. Proboscis very short. Pre-alar seta *very* small or hair-like, much smaller than notopleural setae. Presutural *acr* setae absent. Lower prostigmatic seta well developed, proclinate. Pteropleural seta small but clearly differentiated. Barette bare. Apical scutellar setae strong, subequal in size to lateral setae. Mid tibia with one (small) *ad* seta. Hind tibia with two or three *ad* setae, one *av* seta and a strong *pv* apical seta. Wing venation as Fig. 21: cell R_5 open at wing apex; bend of vein *M* gently rounded or at most slightly abrupt and very widely obtuse; *m–cu* straight and at right-angles to veins *M* and Cu_1; basal node of R_{4+5} setulose; costal spine undifferentiated. Abdomen without discal setae; T1+2 without median marginal setae. ♂ genitalia with small pointed cerci much shorter than surstyli, distiphallus similar to that of *Rhinomorinia*, and ejaculatory sclerite minute and rod-like.

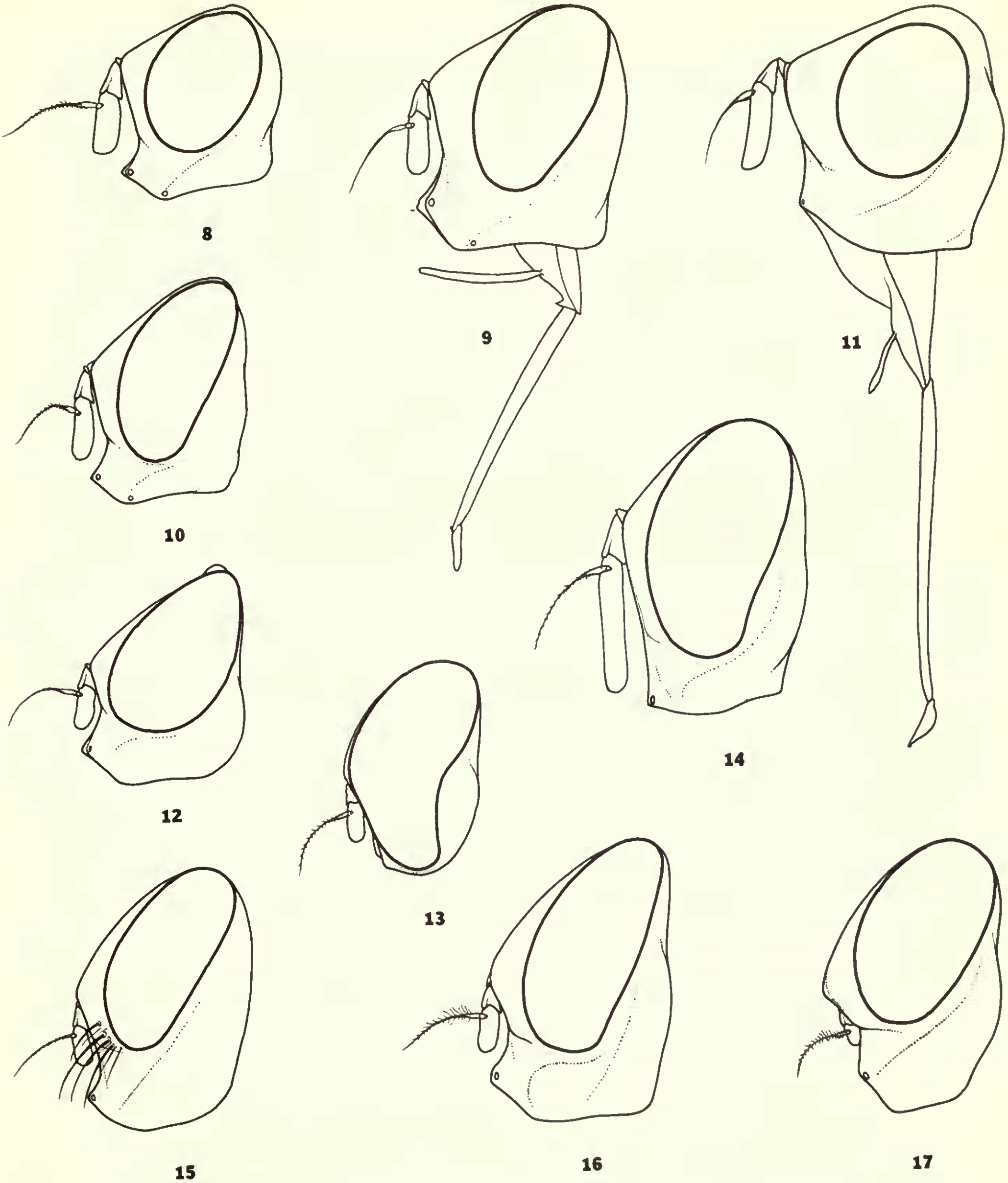
Distribution. Eastern and southern Africa.

Discussion. This genus is erected for a new species that differs strikingly from all other Rhinophoridae in the conformation of the head. The eyes are exceptionally large, somewhat kidney-shaped in profile, and in the male in facial view they approach each other in an unusual way about at a level with the junction of the second and third antennal segments; in consequence of the eye shape the male head has the frontal region conspicuously narrowing at the lunula so that the upper facial region between the eyes appears distinctly 'pinched-in'. In both sexes the genal region is very reduced in association with the enlargement of the eyes so that it appears as a mere narrow strip between the lowermost point of the eye and the ventral margin of the head (Fig. 13), and the vibrissae (unlike those of any other rhinophorids known to me) are positioned well above the bottom of the eye.

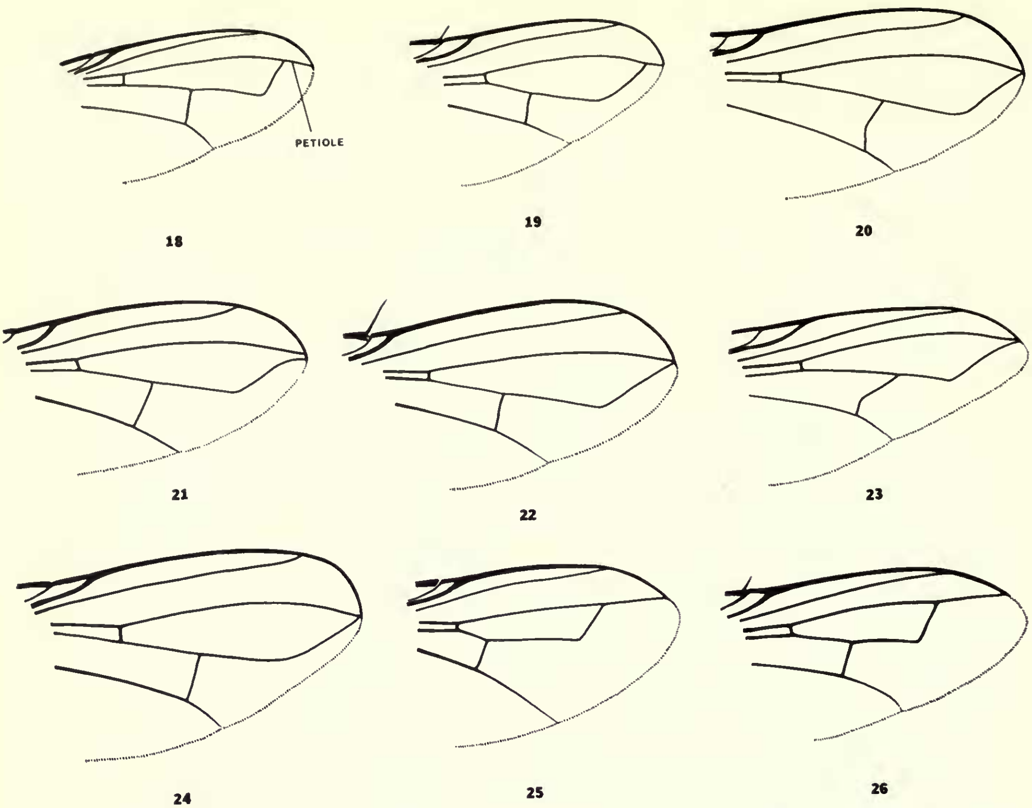
This head conformation recalls that of certain Tachinidae, and combined with the small size and generally shining black appearance of the flies is specially reminiscent of some Dufouriini s. l. *Ventrops*, however, has all the characters of Rhinophoridae except for the atypical head and is undoubtedly rightly placed in this family. The small pre-alar seta, wing venation, and structure of the distiphallus of the aedeagus suggest a possible relationship to *Rhinomorinia*, but this genus and *Ventrops* could never be confused because of the very different head shape (cf. Figs 8–10 with Fig. 13).

Ventrops milichioides sp. n.

Description. ♂. Head, antennae and palpi black. Head shape as Fig. 13. Frons with three pairs of proclinate orbital setae. Ocellar setae well developed, widely proclinate. Occiput not swollen, haphazardly covered with strong black setulae. Third antennal segment about twice as long as second. Thorax black and shining, dorsum with *very* inconspicuous trace of dark bronze-brownish pollinosity seen in some lights. Three *stpl* setae. Infrasquamal hairs few, minute. Scutellum with a pair of small straight setae differentiated between the strong lateral and apical setae, and with a pair of very small setae differentiated basad of the lateral setae. Legs black; claws moderately long (fore claws nearly as long as last tarsal segment). Wings pale brown, infuscation weakening towards hind margin; basicosta blackish brown; halteres black. Wing venation as Fig. 21. Calyptrae whitish. Abdomen black and shining, T3 and T4 each with inconspicuous brownish grey pollinosity on the basal half; T3 with a pair of very strong erect median marginal setae; abdominal hairing recumbent. Measurements: body length 3·1 mm, wing length 2·6 mm [1 specimen].



Figs 8–17 Head profiles, in outline only, of Afrotropical Rhinophoridae. (8) *Rhinomorinia xanthocephala* (♂). (9) *R. vittata* (♀), mouthparts included. (10) *R. atra* (♂). (11) *Phyto longirostris* (♀), mouthparts included. (12) *Melanomyoides capensis* (♂). (13) *Ventrops milichioides* (♂). (14) *Queximyia flavipes* (♀). (15) *Stevenia socotrensis* (♂). (16) *Phyto tachinoides* (♂). (17) *Melanophora roralis* (♂). Setae omitted except for parafacial setae in Fig. 15.



Figs 18–26 Wings of Afrotropical Rhinophoridae, costal vestiture omitted. (18) *Comoromyia griseithorax*. (19) *Melanomyoides capensis*. (20) *Queximyia flavipes*. (21) *Ventrops milichioides*. (22) *Rhinomorinia xanthocephala*. (23) *Phyto tachinoides*. (24) *P. stuckenbergi*. (25) *Melanophora roralis*. (26) *Stevenia socotrensis*.

♀. Very like ♂, differing as follows. Eyes in facial view less strongly approached to each other, area of lunula and upper facial regions not noticeably constricted. Usually two pairs of proclinate orbital setae (but sometimes three). Claws very short. Abdomen non-pollinose and entirely shining black. Measurements: body length 2·9–4·2 mm, wing length 2·6–3·5 mm [4 specimens].

Material examined. Holotype ♂, Rhodesia: N. Vumba, 17.v.1964 (*D. Cookson*), in Natal Museum, Pietermaritzburg.

Paratypes. Rhodesia : 2♀, same data as holotype except dates 7.v.1964 and 7.iv.1965; 1 ♀, Lower Lundi River, Chipinda Pools, 2.xi.1960 (*R. Goodier*) (BMNH). Kenya: 2 ♀, Chyulu Hills, 1720 m, v.1938 (*Coryndon Mus. Exp.*) (BMNH).

Notes. The paratypes from Kenya lack the small setae on the scutellum between the lateral and apical setae that are present on the Rhodesian specimens, and also have weaker *post ia* setae than in the Rhodesian material, but I think nevertheless that all the material is probably conspecific.

Ventrops sp. indet.

In addition to the type-material of *V. milichioides* described above I have seen one other specimen of *Ventrops*. This specimen shows that the genus occurs in South Africa as well as Kenya and Rhodesia and almost certainly represents a second species of *Ventrops*. It is unjustified to describe it as a new species, since the differences from *milichioides* might not be significant and the male is not known that would associate with it. The gena, though small, is wider than in *milichioides*, being almost as wide as the third antennal segment, and the wing is much less uniformly brown (brown colour occurring broadly along the costal margin, broadly along *M* to beyond *m–cu*, along Cu_1 and on *m–cu*, and the rest of the wing being hyaline). Data of the specimen are:

SOUTH AFRICA: 1 ♀, Transvaal, Kruger Park, Pretoriuskop area 2531Ab, 9.xii.1972 (*B. & P. Stuckenberg*) (NMP).

Genus *MELANOMYOIDES* gen. n.

Type-species: *Chaetostevenia capensis* Zumpt, 1959.

DIAGNOSIS. Head profile as Fig. 12. Eyes obliquely suboval in outline but more strongly pointed dorsally than usual; gena large, its depth much greater than antennal width. Epistome strongly warped forwards from the face, facial profile concave. Vibrissal angles sharp, about as prominent as the profrons, vibrissae inserted slightly below lowermost point of the eye but well above lowermost point of the head. Eyes of ♂ very strongly approximated. ♂ without proclinate orbital setae and without prevertical setae, with (small) outer vertical setae. Parafacials narrow but visible on their whole height in profile, totally bare. Antennae small, not reaching epistome, antennal axis below eye middle; arista bare. Proboscis short. Pre-alar seta hair-like, much smaller than notopleural setae. Presutural *acr* setae present. Lower prostigmatic seta very weak and slightly proclinate. Pteropleural seta hair-like. Barette bare. Apical scutellar setae extremely strong, crossing in basal half and slightly larger than lateral setae (latter inserted much closer to scutellar base than to apical setae). Mid tibia with one *ad* seta. Hind tibia with two *ad* setae, one *av* seta and a strong *pv* apical seta. Wing venation as Fig. 19. Cell R_5 closed and with medium-sized petiole about twice as long as *r–m*; bend of *M* gently and evenly rounded and widely obtuse; *m–cu* almost straight and about at right-angles to *M*; basal node of R_{4+5} with one strong setula (with or without additional hair); costal spine strong. Abdomen without discal setae on intermediate tergites; T1+2 without median marginal setae. ♂ genitalia with short cerci and surstyli of equal length, surstyli broadly foliaceous (Fig. 33); ejaculatory sclerite large and fan-shaped.

DISTRIBUTION. Known only from South Africa.

DISCUSSION. This genus is proposed for *Chaetostevenia capensis* Zumpt, a species that is difficult to place satisfactorily but which certainly does not belong to the European genus *Chaetostevenia* Brauer, 1895 (=*Paykullia* Robineau-Desvoidy, 1830). Zumpt (1959) assigned his new species *capensis* to *Chaetostevenia* simply because it ran down to this generic name in Séguy's (1941) key to European rhinophorine genera, and not on the basis of comparison with actual material of *Chaetostevenia*, and it seems unlikely that Zumpt would have described *capensis* in *Chaetostevenia* if material of this genus had been available to him. Although *capensis* shares a few characters with *Paykullia* (syn. *Chaetostevenia*), and even runs rather well to this genus in Herting's (1961) more recent key to European genera – because it has a petiolate R_5 cell, bare parafacials, short face, strong apical scutellar setae and a small pre-alar seta – there is scarcely any resemblance in the total facies. The head shape of *capensis* (Fig. 12), with its prominent vibrissal angles, excavate face and anteroventral angulation of the ventral outline, is nothing like that of *Paykullia* (in which the face is flat, the vibrissal angles undeveloped and the deep genal region regularly rounded), but instead is much closer to that of *Rhinomorinia* or even *Rhinophora*; and the wing venation is also different, despite common possession of a petiole, because in *Paykullia* the 'bend' of *M* is of the very abruptly 'right-angular' type and not of the widely obtuse type as in *capensis*. In short, I think it certain that there is no close phyletic relationship between the South African species *capensis* and the European genus *Paykullia* (i.e. *Chaetostevenia*), that *capensis* is misplaced and that *Paykullia* is not represented in the Afrotropical Region.

On the other hand, it is difficult to decide what to do with *capensis*, for whilst clearly not a *Paykullia* it is not unambiguously assignable to another described genus. In these circumstances I erect the new monotypic genus *Melanomyoides* for it, but with some reluctance, and certainly with the proviso that it might not be possible to maintain the genus as valid when much more is known about South African rhinophorids and their hosts. Future studies might show that *capensis* could be legitimately assigned to a widened concept of *Melanomya* or of *Angioneura* or of *Rhinomorinia*, to each of which it shows resemblances that might be indicators of close phyletic relationship. Some of the main resemblances to, and distinctions from, these genera require enumeration.

Melanomyoides capensis (Zumpt) **comb. n.** is a small slender shining black species superficially extremely like the European *Melanomya nana* (Meigen), the only species of *Melanomya* in Herting's (1961) monograph and type-species of the genus. It greatly resembles *Melanomya* in the very strongly approximated male eyes and reduced frons and in the abdominal vestiture but differs by the very prominent epistome (face flat in *Melanomya*), bare arista (arista plumose in *Melanomya*), extremely strong apical scutellar setae (these very weak or hair-like in *Melanomya*), hair-like pre-alar seta (*pra* strong in *Melanomya*), and by the petiolate cell R_5 (this cell well open at the wing edge in *Melanomya*).

There is also a strong superficial resemblance between *M. capensis* and the European species *Angioneura fimbriata* (Meigen). Both are small slender shining black forms with strongly approximated male eyes and reduced frons (lacking proclinate orbital and prevertical setae, as also in *Melanomya*), but *capensis* differs from *Angioneura* by many of the same characters as differentiate it from *Melanomya*, such as the head shape, petiolate R_5 and the enormous apical scutellar setae. But *M. capensis* agrees with *Angioneura* in having the very small pre-alar seta, and on balance there is slightly closer agreement between *A. fimbriata* and *M. capensis* than between *M. nana* and *M. capensis*.

In the southern African fauna *M. capensis* is certainly closest to *Rhinomorinia*, and there is considerable correspondence between the characters of *Melanomyoides* and this genus. For example the head shape, in which the epistome is warped forwards from the face, the vibrissal angles very prominent and the ventral outline of the head distinctly angulate, is similar in both genera, but the genitalia of *M. capensis* are quite distinct from those of any *Rhinomorinia* species that has been examined, the surstyli being enormous flat subcordate plates (instead of the long narrow prong-like processes found in *Rhinomorinia* species). Surstyli of this broadly foliaceous kind are not found anywhere else in the Rhinophoridae to my knowledge (although male genitalia have not been examined for all genera), and the form of the male hypopygium, including aedeagal shape as well as the surstyli, supports the proposal of a new genus for *capensis*. There is a general resemblance between the distiphallus of *Rhinomorinia* and *Melanomyoides*, however, in so far as the anteromedian surface of the distiphallus is armed with numerous strong individual spines in both genera. Nothing comparable exists in the distiphallus of *Melanomya* or *Angioneura*, which totally lacks the spinous areas characteristic of *Rhinomorinia* and *Melanomyoides* (and also *Phyto*).

Apart from the surstylus shape, *Melanomyoides* differs from *Rhinomorinia* in the petiolation of cell R_5, in the lack of any trace of pale pollinose vittae on the mesonotum, in the reduced palpi, and in the possession of only one *av* seta on the hind tibia (sometimes a minute *av* setula in addition). It differs from all *Rhinomorinia* species except *R. capensis* (Brauer & Bergenstamm) and *R. approximata* sp. n. in lacking prevertical setae in the male, and from all *Rhinomorinia* species except the Nepalese *R. longifacies* Herting in having the lateral scutellar setae inserted much nearer to the scutellar base than to the apical scutellar setae. Some of these distinctions from *Rhinomorinia* are, of course, not very tangible and despite the male genitalic difference from *Rhinomorinia* and the close superficial resemblances to *Melanomya* and *Angioneura*, I think it likely that *Melanomyoides* is phyletically very close to *Rhinomorinia*. (Nomenclaturally, it should be noted, *capensis* Zumpt will be a junior homonym of *capensis* Brauer & Bergenstamm, if *Melanomyoides* and *Rhinomorinia* should be merged, and will then require a new name.)

Melanomyoides capensis (Zumpt) **comb. n.**

Chaetostevenia capensis Zumpt, 1959 : 433. Holotype ♂, SOUTH AFRICA (UZI, Lund) [examined].

DESCRIPTION. ♂. Head ground colour black, occipital regions shining and non-pollinose, parafacials thickly silvery white pollinose, face thinly yellowish brown pollinose; antennae black, palpi blackish brown. Head as Fig. 12, upper occiput flat. Eyes extremely strongly approximated and frons very reduced, frons at narrowest point about twice as wide as anterior ocellus and narrower than third antennal segment, about 0·065 of head-width (but interfrontal area distinct on whole height of frons and parafrontals *not* meeting despite extreme approximation of the eyes). Proclinate orbital setae absent. Prevertical setae absent, outer vertical setae present but small. Parafacial at mid point about half as wide as third antennal segment. Upper occiput bare behind the postocular row. Third antennal segment about 1·9 times as long as second. Palpi small, shorter than third antennal segment. Thorax shining black with thick silver white pollinosity on humeral calli (no trace of vittae); pleural regions with very inconspicuous thin yellowish brown pollinosity. Two humeral setae. Two or three *stpl* setae. Infrasquamal hairs absent or in a small tuft. Legs black; claws very long. Fore tibia without *pd* setae. Mid femur with some inconspicuous setulae on the *a* surface amongst the normal hair. Hind tibia normally with one *av* seta but sometimes accompanied by a second small setula. Wings nearly hyaline; basicosta blackish brown; halteres yellow. Wing venation as Fig. 9. Spinules of first costal sector numerous and not enlarged. Calyptrae yellowish white. Abdomen black and rather shining, with diffuse pollinosity, the pollinosity whitish and moderately conspicuous laterally on T3 and T4 but more greyish or brownish and rather inconspicuous medially on these tergites and on T5. Abdominal T3 without median marginal setae (but with rather long marginal hairs); intermediate tergites with short erect hairing; T7+8 with a pair of long strong setae (visible in situ), epandrium small and inconspicuous in situ. Cerci and surstyli as Fig. 33. Measurements: body length 3·3–3·7 mm, wing length 3·0–3·4 mm [6 specimens].

♀. Similar to ♂ but with widely separated eyes, the frons 0·33 of head-width and with one or two pairs of proclinate orbital setae; parafrontals shining black on uppermost two-thirds and silvery white pollinose on lowermost thirds (the pollinosity continuous with that of the parafacials). Abdomen unicolorous shining black without pollinosity. Measurements: body length 2·7–3·1, wing length 2·6–2·7 mm [only 3 specimens seen, perhaps unusually small].

MATERIAL EXAMINED. Holotype ♂, SOUTH AFRICA: Cape Province, Cape Peninsula, Hout Bay, Skoorsteenkop, 2.ii.1951 (*Brinck & Rudebeck*), in Universitetets Zoologiska Institution, Lund. (The holotype is gummed to a card mount, has lost both mid legs, the tip of the left hind tarsus and the right third antennal segment, and the genitalia are separately slide-mounted. The genitalia slide has the aedeagus, ejaculatory sclerite and cerci and surstyli disconnected, the cerci and surstyli being flattened out from behind as in Zumpt's figure.)

SOUTH AFRICA: 8 ♂, 3 ♀, Cape Province, Cape Peninsula, Silvermine nature reserve, 2–3.i.1972 (*B. H. Cogan*) (BMNH, except one ♂ and one ♀ in NMP).

NOTE ON THE TYPE-MATERIAL. Zumpt's (1959 : 433) description mentions '2 ♂♂, 8 ♀♀', all with the same locality but with collecting date range 22.i–18.ii.1951, and does not mention any particular specimen as type. But Zumpt (*op. cit.*: 427) refers to the 'holotypes' in the introduction to his paper, stating that they are in Lund, and because of this statement and the fact that one of the males bears a holotype label it is considered that *capensis* was originally based on a holotype (even though all specimens appear to have the status of syntypes if only the original description on p. 433 is considered). The Lund collection contains, with the holotype, five ♀ paratypes. Presumably the remaining four paratypes (♂ and three ♀) were retained by Zumpt. None of the paratypes has been seen, but all are certainly conspecific with the holotype.

Genus ***RHINOMORINIA*** Brauer & Bergenstamm

Rhinomorinia Brauer & Bergenstamm, 1889 : 123 (55). Type-species: *Morinia sarcophagina* Schiner, 1862, by monotypy.

Oxytachina Brauer & Bergenstamm, 1891 : 369 (65). Type-species: *Oxytachina vittata* Brauer & Bergenstamm, 1891, by monotypy. **Syn. n.** [The only included species cited as '*vittata* Wd.' but this specific name not published by Wiedemann and attributable to Brauer & Bergenstamm. Situation considered not to be exact equivalent of 'gen. n., sp. n.' under the terms of I.C.Z.N. Code Article 68 (a) (i) and *vittata* therefore cited as fixed by monotypy and not original designation.]

Pseudophania Brauer & Bergenstamm, 1893 : 139 (51). Type-species: *Pseudophania capensis* Brauer & Bergenstamm, 1893, by original designation. **Syn. n.** [The only included species name attributable to Brauer & Bergenstamm and based on Schiner manuscript name 'Besseria capensis'. Genus explicitly proposed by Brauer & Bergenstamm 'für' *capensis* and type-species therefore fixed by original designation.]

Dewetia Bischof, 1904 : 95. Type-species: *Dewetia atra* Bischof, 1904, by monotypy. **Syn. n.**

DIAGNOSIS. Head shape as Figs 8–10 or similar. Eyes narrowly to broadly suboval or almost subcircular in outline, slightly to strongly oblique; gena of moderate size, its depth slightly to much greater than antennal width. Epistome moderately to strongly warped forwards from the face, facial profile conspicuously concave. Vibrissal angles strongly developed, from slightly less to slightly more prominent than the profrons; vibrissae inserted below lowermost point of the eye but much above lowermost point of the head (head in profile with a rather strong anteroventral angulation). Eyes of ♂ widely separated or approximated. ♂ with or without proclinate orbital setae, with prevertical setae (except in *approximata* and *capensis*), with or without outer vertical setae. Parafacials well visible in profile (narrowly in *setitibia*), usually haired at least at extreme upper ends. Antennae small or medium-sized, falling short of epistome, antennal axis usually about level with eye middle; arista pubescent or bare. Proboscis usually short (long in *vittata*, Fig. 9). Pre-alar seta weak or absent [except, according to Herting (1961), in *subrostrata* Villeneuve, not seen]. Presutural *acr* setae almost always differentiated as at least one pair. Lower prostigmatic seta variable, often rather strong and slightly proclinate. Pteropleural seta usually rather long and fine (about as long as notopleurals), sometimes hair-like. Barette bare (rarely an adventitious hair). Apical scutellar setae variable, hair-like to extremely strong; lateral scutellar setae inserted equidistantly between scutellar base and apical setae (except nearer base in *longifacies* Herting from Nepal). Mid tibia with one or two *ad* setae. Hind tibia with two or more *ad* setae, with two *av* setae (exceptionally only one), and a *pv* apical seta. Wing cell R_5 open or closed in wing margin (with *very* short petiole half as long as *r–m* in *setitibia* and trace of petiole in *capensis*); bend of vein *M* widely obtuse, gently rounded or at most only very slightly abrupt; *m–cu* straight or slightly sinuous, at right-angles to or oblique to vein *M*; basal node of R_{4+5} with one strong or very strong setula, often accompanied by one or two hairs; costal spine well developed (sometimes as much as three times as long as *r–m*). Abdomen with or without discal setae; abdominal T1+2 without median marginal setae. ♂ cerci and surstyli narrow and usually very elongate, often borne on much enlarged epandrium; ejaculatory sclerite small or medium-sized, narrowly spatulate or fan-shaped.

DISTRIBUTION. Palaearctic Region, Oriental Region (Nepal) and southern Afrotropical Region. Occurring widely in Europe but absent from Scandinavia and British islands; apparently unknown from North Africa and Atlantic islands.

DISCUSSION. At the time of Herting's (1961) account of the Palaearctic fauna only two species were placed in *Rhinomorinia*, both being European, but a Nepalese species was later described by Herting (1966), and I am now assigning to the genus a further nine species from southern Africa (four of which were previously described and five of which are new). The new placement of African forms into the genus widens the generic concept to some extent and requires brief discussion.

Brauer & Bergenstamm (1891; 1893) described the genera *Oxytachina* and *Pseudophania*, and Bischof (1904) described the genus *Dewetia*, each of these genera being monotypic for species from South Africa (viz. *O. vittata*, *P. capensis* and *D. atra* respectively). Up to now these nominal genera have been virtually ignored by dipterists (the types being in Vienna and African rhinophoroids being so little investigated) but Townsend (1935; 1938) placed all three as valid in his Melanophorini, and Villeneuve (1918) briefly alluded to the close affinity of *Pseudophania* and *Dewetia* to the European genus *Rhinomorinia*; evidently Villeneuve had observed the obvious resemblance of *Dewetia* and *Pseudophania* to each other, and of both to *Rhinomorinia*, even though he did not establish formal synonymy of the names. In the present work I treat both *Dewetia* and *Pseudophania* as synonymous with *Rhinomorinia*, having been unable from a critical comparison of the type-species to discover any character or set of characters that justifies their separation. *Oxytachina* was not seen, or at any time discussed, by Villeneuve, but this nominal genus, too, I synonymize with *Rhinomorinia*: it is known only from the female holotype of *O. vittata*, which on first glance appears rather different from *Rhinomorinia* (because of its elongate proboscis and strongly vittate thorax), but which in fact possesses all the essential characters of *Rhinomorinia* and which in my opinion cannot legitimately be distinguished from it at the generic level. Zumpt (1959), it may be noted, did not deal with *Oxytachina*, but he did synonymize *Dewetia atra* with *Pseudophania capensis*, an action that thereby synonymizes *Dewetia* with *Pseudophania* even though Zumpt did not state so.

Apposite here to the question of generic limits is the generic position of the most common South African rhinophorid, the species described as *Hoplisa xanthocephala* by Bezzi (1908) and later as *Hoplisa novicia* by Villeneuve (1916) (for new synonymy of these names see under the species treatment for *xanthocephala*). This species is very distinctive because of its largely yellow head, extremely prominent epistome, grey vittate thorax and exceptionally strong costal spine and costal spinules, and looks very different from the shining black *Rhinomorinia* species such as the European type-species, *R. sarcophagina* (Schiner) and South African species such as *R. atra* and *R. capensis* (type-species of *Dewetia* and *Pseudophania* respectively). On the other hand, its head shape, head vestiture and very strong wing-node bristle are very reminiscent of the European genus *Oplisa* (= *Hoplisa*, emendation), and it is not surprising that Bezzi and Villeneuve both described the species in *Oplisa*.

The genera *Rhinomorinia* and *Oplisa* are extremely similar and I was at first inclined to widen the concept of *Oplisa* (the name dating from Rondani, 1862) so as to include *Rhinomorinia* (and its synonyms *Oxytachina*, *Pseudophania* and *Dewetia*) within it, a course that seemed justified by the close structural and chaetotactic resemblance between some species of *Rhinomorinia* (especially *xanthocephala*) and *Oplisa tergestina* (Schiner), the type-species of *Oplisa*. This course has been contra-indicated, however, by examination of the male hypopygium, as detailed below.

The genus *Oplisa* contains, according to Herting (1961), three western Palaearctic species and is not known outside of Europe and North Africa (*xanthocephala* being here placed in *Rhinomorinia*). One of the three species, *oldenbergi*, was described by Herting (1961) and placed by him in a new subgenus of *Oplisa*, namely *Anoplisa*, this species (not seen) being known only from the male holotype and differing from the other two species in having proclinate (i.e. normal) ocellar setae. The other two species, *tergestina* and *aterrima* (Strobl), constituting *Oplisa* s. str. in Herting's treatment, have the ocellar setae reclinate or at least directed straight outwards, and in this character differ from all *Rhinomorinia* species and (to the best of my knowledge) from all other rhinophorids. The male genitalia of *tergestina* and *aterrima* have been examined and found to be virtually identical with each other, but to differ from *Rhinomorinia* species (and from all other Rhinophoridae for which I have examined the male hypopygium) by the possession of a quite extraordinary ejaculatory sclerite. This structure throughout the calyptrate flies is typically quite small or of moderate size and its shape rod-like, clove-like or spatulate and fan-like, but in *Oplisa tergestina* and *O. aterrima* it takes the form of an enormous ovate or leaf-like plate articulated to a small strongly sclerotized incomplete ring and extending far forwards into the abdomen (Fig. 40). This feature, taken together with the reclinate ocellar setae, makes *Oplisa* s. str. unique, and disinclines me to widen the concept of the genus so as to incorporate *Rhinomorinia* within it. I therefore maintain *Rhinomorinia* as a distinct genus from *Oplisa*, whilst considering that they are probably close affines phyletically.

Key to Afrotropical species of *Rhinomorinia* Brauer & Bergenstamm

Males

[*Note.* The males of *scutellata* and *vittata* are unknown.]

1 Prevertical setae absent 2
– Prevertical setae present 3
2 Eyes extremely strongly approximated, frons at narrowest point 0·08 of head-width (narrower than third antennal segment). Thoracic dorsum with the silver vittae confined to the prescutum (stopping abruptly at the transverse suture). Costal spine conspicuously shorter than second costal sector . . . . **R. approximata** sp. n. (p. 29)
– Eyes much less strongly approximated, frons at narrowest point about 0·18 of head-width (much wider than third antennal segment). Thoracic dorsum with the submedian silver vittae not completely confined to the prescutum (when seen in some lights conspicuously extending on to the scutum and from some viewpoints faintly evident back to the scutellum). Costal spine as long as the second costal sector . . . **R. capensis** (Brauer & Bergenstamm) (p. 30)
3 Interfrontal area unicolorous orange-yellow, or reddish orange anteriorly and dark reddish brown posteriorly. Apical scutellar setae weak or hair-like (not more than half as long as lateral setae). Thoracic dorsum with the paired silvery or grey pollinose vittae complete (well developed on scutum as well as prescutum and reaching scutellum). Mid femur with a row of several setae on the *a* surface 4

– Interfrontal area black. Apical scutellar setae strong (as large as, or not much smaller than, the lateral setae). Thoracic dorsum with the paired silvery or grey pollinose vittae incomplete (absent or evanescent on scutum or only partially evident from certain directions, sometimes also weakly defined on prescutum). Mid femur with not more than two definite setae on the *a* surface 5

4 Interfrontal area orange-yellow. One pair of proclinate orbital setae. Outer vertical setae present. Abdominal T3 with long erect median marginal setae, T4 with a pair of small fine erect discal setae. Mid tibia with two *ad* setae . . . . . ***R. xanthocephala*** (Bezzi) (p. 35)

– Interfrontal area reddish orange anteriorly and dark reddish brown posteriorly. Two pairs of proclinate orbital setae. Outer vertical setae absent. Abdominal T3 without median marginal setae, T4 without discal setae. Mid tibia with one *ad* seta . . . . . ***R. bisetosa*** sp. n. (p. 35)

5 Abdominal T3 with a pair of strong erect median marginal setae, T4 (and sometimes also T3) with median discal setae. Upper occiput bare behind the postocular row. Outer vertical setae absent. Frons not more than 0·27 of head-width. Abdomen with conspicuous fasciae of silvery white pollinosity basally on T3, T4 and T5 (the fasciae incomplete medially) . . 6

– Abdominal T3 without median marginal setae, both intermediate tergites without discal setae. Upper occiput with strong black setulae behind the postocular row. Outer vertical setae present. Frons wider, about 0·32 of head-width. Abdomen with rather diffuse greyish pollinosity . . . . ***R. verticalis*** sp. n. (p. 33)

6 Fore tibia without *pd* setae. Frons without proclinate orbital setae. Parafacials broad, at mid point nearly as wide as third antennal segment. Abdominal T3 without discal setae. Arista conspicuously pubescent. Wing with cell R_5 closed at or just before the margin ***R. atra*** (Bischof) (p. 31)

– Fore tibia with a submedian *pd* seta and a preapical *pd* seta. Frons with one pair of proclinate orbital setae. Parafacials narrow, at mid point hardly half as wide as third antennal segment. Abdominal T3 (as well as T4) with strong erect discal setae. Arista bare. Wing with cell R_5 short-petiolate (the petiole about as long as *r–m*) . . . . . ***R. setitibia*** sp. n. (p. 32)

Females

1 Head with one pair of proclinate orbital setae 2

– Head with two pairs of proclinate orbital setae 5

2 Interfrontal area orange-yellow. Apical scutellar setae very weak or hair-like (much less than half as long as lateral setae). Thoracic dorsum with a pair of conspicuous broad ashy grey vittae, complete on whole length of prescutum and scutum. Head with outer vertical setae *and* abdomen with median marginal setae on T3 . . . . . ***R. xanthocephala*** (Bezzi) (p. 35)

– Interfrontal area black or dark reddish brown. Apical scutellar setae moderately to very strong (at least half as long as lateral setae and usually almost as large). Thoracic dorsum with pale vittae incomplete, absent on scutum or only partially developed and just detectable in certain lights. Outer vertical setae and median marginal setae of T3 not present simultaneously . 3

3 Abdominal T3 without median marginal setae and T4 without discal setae. Fore tibia without *pd* setae. Upper occiput with black setulae behind the postocular row 4

– Abdominal T3 with strong erect median marginal setae and T4 with median discal setae. Fore tibia with a submedian *pd* seta and a preapical *pd* seta. Upper occiput without setulae behind the postocular row . . . . ***R. setitibia*** sp. n. (p. 32)

4 Outer vertical setae present. Apical scutellar setae about as large as the lateral setae. Mid tibia with one *ad* seta. Interfrontal area black . . . . ***R. verticalis*** sp. n. (p. 33)

– Outer vertical setae absent. Apical scutellar setae about half as long as the lateral setae. Mid tibia with two *ad* setae. Interfrontal area dark reddish brown . . ***R. scutellata*** sp. n. (p. 34)

5 Abdominal T4 without discal setae. Thoracic dorsum with complete and conspicuous broad silvery or grey vittae (well developed on both prescutum and scutum). Upper occiput with black setulae behind the postocular row. Mid femur with a row of several setae on the *a* surface 6

– Abdominal T4 with erect discal setae. Thoracic dorsum with incomplete silvery or grey vittae (these absent or weakly differentiated and discernible only at certain angles on the scutum, distinct only on the prescutum). Upper occiput bare behind the postocular row. Mid femur with not more than two definite setae on the *a* surface 7

6 Abdominal T3 with a pair of strong erect median marginal setae. Interfrontal area blackish. Scutellum with thick pale yellowish grey pollinosity on the middle two-thirds, black only at the sides. Proboscis long and slender (the length exceeding the head height, Fig. 9). Outer vertical setae present . . . . ***R. vittata*** (Brauer & Bergenstamm) (p. 38)

– Abdominal T3 without median marginal setae. Interfrontal area orange-red anteriorly and dark reddish brown posteriorly. Scutellum unicolorous shining black. Proboscis not elongate (shorter than height of the head). Outer vertical setae absent . . . ***R. bisetosa*** sp. n. (p. 35)

7 Abdominal T5 unicolorous shining black. Costal spine less than twice as long as *r–m* and shorter than second costal sector
? ***R. approximata*** sp. n. or ***R. capensis*** (Brauer & Bergenstamm)* (p. 30)

– Abdominal T5 with bright silvery white pollinosity on the basal half. Costal spine stronger, twice as long as *r–m* and subequal in length to second costal sector . ***R. atra*** (Bischof) (p. 31)

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* The ♀ paralectotype of *capensis* runs out here. It is probable that it is misassociated with the lectotype and actually a specimen of *R. approximata*.

Rhinomorinia approximata sp. n.

DESCRIPTION. ♂. Head ground colour black except for dark reddish brown subparafacial areas, upper occiput rather shining; parafrontals and parafacials thickly silvery white pollinose, genae and postbuccae also conspicuously white pollinose when seen from above, vertex without evident pale pollinosity behind the ocellar triangle; antennae black; palpi tawny yellowish with darker tips. Head higher than long, eye profile suboval and oblique, epistome moderately strongly warped forwards from the face and about as prominent as the profrons, upper occiput flat. Eyes unusually strongly approximated [specific name alluding to this character], frons very reduced and at narrowest point above 0·08 of head-width (not as wide as third antennal segment); parafrontals exceedingly narrow on upper parts but not actually meeting in mid-line despite frontal reduction, the interfrontal area differentiated on its whole height. Proclinate orbital setae absent. Prevertical setae absent. Outer vertical setae absent and inner vertical setae unusually short (about as long as antennae). Parafacials moderately broad, at mid point about two-thirds as wide as antennae, bare except for a very few tiny hairs at extreme upper ends. Upper occiput bare behind postocular row. Antennae medium-sized, third segment about 1·9 times as long as second segment; arista pubescent. Proboscis short. Thorax shining black with thick silvery white pollinosity over humeral calli and notopleura and on a pair of broad close-set submedian prescutal vittae (silvery vittae stopping abruptly at transverse suture and not continuing on to scutum when seen from any angle); pleural regions thinly white pollinose. Two humeral setae. 1 + 1 *acr* setae. Two *stpl* setae (plus a straight strong hair in position of lower anterior *stpl* seta). Pteropleural seta weakly differentiated. Infrasquamal hairs conspicuous. Scutellum with very strong apical setae (slightly shorter than laterals), basal setae represented by strong hairs, lateral setae inserted about equidistantly between scutellar base and apical setae. Legs black; claws long. Fore tibia without *pd* setae. Mid femur without setae on the *a* surface. Mid tibia with one *ad* seta. Hind tibia with two *ad* setae and two *av* setae. Wings almost hyaline; basicosta orange-yellow; halteres yellow. Cell R_5 closed exactly at wing margin; *m–cu* very slightly oblique in relation to *M* and about mid-way between *r–m* and the bend, angled inwards near the middle; costal spine well developed but not unusually strong, distinctly shorter than second costal segment; costal spinules numerous and not obviously enlarged; basal node of R_{4+5} with one very long strong setula accompanied by one or two small hairs. Calyptrae pale yellowish. Abdomen shining black with conspicuous basal bands of silvery white pollinosity on T3, T4 and T5, the pollinose bands interrupted medially (especially on intermediate tergites) (pale pollinosity about a third or two-fifths of length of intermediate tergites dorsally and about half length of these tergites laterally). Abdominal T3 with a pair of very strong erect median marginal setae and without discal setae; T4 with a pair of strong erect median discal setae; both intermediate tergites with rather strong sparse recumbent hairing. T7 + 8 forming a shining knob visible in situ below and behind T5 and epandrium enlarged, both epandrium and T7 + 8 with very strong setae. Cerci extremely long and extremely narrow. Measurements: body length 5·0 mm, wing length 4·5 mm [1 specimen].

♀. Unknown [but ♀ paralectotype of *capensis* might be this species].

MATERIAL EXAMINED. Holotype ♂, SOUTH AFRICA: Cape Province, Patensie District, Cambria area, Wit River valley, 3324DA, 6.xii.1967 (*B. & P. Stuckenberg*), in Natal Museum, Pietermaritzburg.

AFFINITIES. This new species is known only from the male holotype, which although superficially similar to *R. atra* and *R. capensis* differs from these (and all other Afrotropical *Rhinomorinia* species) in having extremely strongly approximated eyes. The frons is much reduced and proclinate orbital and prevertical setae are lost. Apart from the head there is very little difference between *approximata* and *atra* and *capensis*, and *approximata* is unquestionably phyletically very close to these species (*approximata* representing a more apomorphic stage from these species towards the fully holoptic male head condition with its associated loss of orbital and prevertical bristles). From *atra* the new species is easily differentiated by absence of prevertical setae and from *capensis* by the afore-mentioned much narrowed frons; from both these species *approximata* differs by having a smaller costal spine (that is obviously shorter than the second costal segment) and by having the submedian silver vittae of the thorax stopping abruptly at the transverse suture (i.e. with no trace of extension posteriorly on to the scutum). *R. approximata* differs from *R. setitibia* (a fourth species forming a natural group with *approximata*, *capensis* and *atra*) by the narrow frons, lack of proclinate orbital and prevertical setae, and lack of posterodorsal setae on the fore tibia.

The ♀ paralectotype of *capensis* (which differs from the females of *atra* and *setitibia* by having the fifth abdominal tergite uniformly shining black instead of pale-banded) might be mis-associated with the lectotype, and could perhaps be a specimen of *approximata*.

Rhinomorinia capensis (Brauer & Bergenstamm) **comb. n.**

Pseudophania capensis Brauer & Bergenstamm, 1893 : 139 (51) ('*Besseria capensis* Schiner' MS name); Villeneuve, 1918 : 504; Townsend, 1931 : 383; Townsend, 1935 : 251; Townsend, 1938 : 201; Zumpt, 1959 : 434. Lectotype ♂ (by fixation as 'type' by Villeneuve, 1918 : 504), SOUTH AFRICA (NM, Vienna) [examined].

DESCRIPTION. ♂. Extremely similar to *R. atra* described below and only differing as follows. Head without trace of prevertical setae. Frons slightly but distinctly narrower than in *atra*, at narrowest point about 0·18 of head-width. Cell R_5 with a *very* short petiole (about two-fifths as long as *r–m*). Measurements: body length 4·3 mm, wing length 3·7 mm.

[♀. Not certainly known, paralectotype ♀ possibly misassociated with ♂ lectotype. Paralectotype differing from *atra* in having the whole of abdominal T5 metallic (no trace of white pollinose band) and from lectotype in having cell R_5 closed at wing edge without trace of petiole. Measurements: body length 5·1 mm, wing length 4·4 mm.]

MATERIAL EXAMINED. Lectotype ♂, SOUTH AFRICA: Cape Province, Cape of Good Hope, in Naturhistorisches Museum, Vienna (coll. Winthem).

Paralectotype. 1 ♀ [presumed correctly associated with lectotype], data and depository as for lectotype.

TYPE-MATERIAL AND STATUS. There is some confusion over the type-material, its whereabouts and status that needs clearing up. At the start of this revision Dr Lichtenberg kindly sent to me from the Vienna collection two specimens standing under the name *Pseudophania capensis* that appeared to be the entire type-series (Brauer & Bergenstamm did not state the number of type specimens before them but their description makes clear that there must have been at least two specimens because both sexes are mentioned). The specimens received from Vienna comprised one ♂ and one ♀, and it was at first assumed that this was the entire type-series. Examination of the ♂ specimen, however, showed that it had a very broad frons possessing both strong proclinate orbital setae and strong prevertical setae, whereas the original description makes it clear by implication that the male of *capensis* should lack proclinate orbital setae (as it is stated for female 'setae orbitales tantum in femina duae'). Furthermore, Townsend's (1938) characterization for the genus *Pseudophania* (type-species *capensis*), based on his examination of types, states '2 PFRO in female and none in male', again meaning that the male lacks proclinate orbital setae. And Villeneuve (1918) also had implied the lack of proclinate orbitals in the ♂ 'type' of *capensis* that he cited, because he compared it with the type of *atra* (which also lacks proclinate orbital setae in the male) and noted that the two species types differed by presence and absence of the *prevertical* seta (i.e. the 'soie frontale postérieure tournée en dehors'), not by the proclinate orbital setae. Thus it was evident that the ♂ specimen cited as 'type' by Villeneuve (1918) and as 'Ht' (i.e. holotype) by Townsend (1931; 1938) could not be the ♂ specimen now standing in the Vienna collection, but that both Villeneuve and Townsend had clearly seen an original ♂ syntype agreeing with Brauer & Bertenstamm's description in lacking proclinate orbital setae.

Thus the true ♂ type was missing from Vienna, and the specimen that could now be found there of this sex had no type-status. It seemed possible that Townsend might have borrowed the

♂ syntype from Vienna many years ago and inadvertently not returned it, and enquiry of Dr Sabrosky at the USNM, Washington, D.C., confirmed that the missing ♂ syntype was indeed present in Townsend's 'genotype' collection at USNM. The specimen is from the von Winthem collection in Vienna (being so labelled), and is undoubtedly the original ♂ syntype on which Brauer & Bergenstamm's description is partially based, and is also without doubt the ♂ 'type' and 'Ht' cited by Villeneuve and Townsend. The specimen has been seen (on loan from USNM) and its return to Vienna is being arranged: for purposes of this paper the specimen is cited as in NM, Vienna.

The status of the specimen is accepted as that of lectotype by fixation of Villeneuve (1918). It could be maintained that neither Villeneuve nor Townsend had provided a valid fixation of the ♂ without proclinate orbital setae as lectotype, since their statements were rather brief and imprecise, but I see no value in setting aside earlier statements in this case and treat Villeneuve's citation of the ♂ 'type' as being a valid lectotype fixation (the statement can refer only to one specimen and there is no real doubt about which specimen is meant). To designate here the same specimen as a new lectotype designation would serve no purpose.

Finally here it should be noticed that Zumpt (1959 : 434), writing of *atra* and *capensis*, refers to having seen 'the types of both species', but it was the ♀ syntype of *capensis* (i.e. paralectotype) that Zumpt saw.

AFFINITIES. *R. capensis* is exceedingly closely allied to *R. atra* and Zumpt (1959) actually synonymized the names. Zumpt's action however was based on a comparison of the female of *capensis* with the *atra* male holotype, and I do not accept the synonymy here. It is notable, too, that neither Villeneuve nor Townsend (both of whom saw the ♂ primary types of the two names) established such synonymy. Nevertheless it is just possible that the holotype of *atra* and the lectotype of *capensis* are conspecific because the differences between them seem to consist only of head features (and the head of the *capensis* lectotype might be aberrant). In *capensis* there are no prevertical setae in the ♂, whereas these are very strong in *atra*, and *capensis* has the frons slightly narrower (about 0·18 of head-width as against about 0·22 in *atra*). The females show a difference in the last abdominal tergite, that of *capensis* being all shining black and that of *atra* having a pale pollinose basal band like that on the preceding tergites (it is not certain, however, that the ♀ paralectotype of *capensis* is rightly associated, and it might be a specimen of *approximata*).

Rhinomorinia atra (Bischof) **comb. n.**

Dewetia atra Bischof, 1904 : 97; Villeneuve, 1918 : 504; Townsend, 1931 : 383; Townsend, 1935: 251; Townsend, 1938 : 189; Zumpt, 1959 : 434. Holotype ♂, SOUTH AFRICA (NM, Vienna) [examined].

DESCRIPTION. ♂. Head ground colour black, interfrontal area sometimes very dark brown, subparafacials dark reddish brown, upper occiput rather shining black; parafrontals and parafacials thickly silvery white pollinose, vertex ashy grey pollinose on either side of posterior part of ocellar triangle; antennae black; palpi tawny yellow. Head higher than long, eye profile suboval and weakly oblique, epistome not very strongly warped forwards from face but about as prominent as profrons, upper occiput flat. Eyes hardly at all approximated, frons at narrowest about 0·225 of head-width. Proclinate orbital setae absent. Prevertical setae present (strong and directed conspicuously outwards), outer vertical setae absent. Parafacials moderately broad, nearly as wide as third antennal segment, bare or with a very few inconspicuous hairs at extreme upper end. Upper occiput bare behind the postocular row. Antennae medium-sized, third segment falling short of epistome and about 1·7 times as long as second segment; arista pubescent. Proboscis short. Thorax black with a pair of submedian silvery white vittae on the prescutum and thick white pollinosity on humeral calli and notopleura; scutum with traces of pale greyish pollinose vittae continuous with those on prescutum, scutal vittae hardly evident on mid part of scutum but distinct in certain lights just before the scutellum; pleural regions thinly white pollinose. Two humeral setae. 1(+)+1 *acr* setae. Two or three *stpl* setae. Pteropleural seta well developed but very fine. Infrasquamal hairs few, minute and very inconspicuous, occasionally absent. Scutellum with strong apical setae (but distinctly shorter than laterals), lateral setae inserted equidistantly between scutellar base and apical setae, basal setae absent. Legs black; claws rather long, especially fore claws conspicuously long and fine. Fore tibia without submedian *pd* seta, without or with very weak preapical *pd* seta. Mid femur usually with one or two setae on the *a* surface, occasionally without. Mid tibia with one or two *ad* setae (usually two). Hind tibia with two *ad* setae and two *av* setae. Wings hyaline or very faintly brownish; basicosta pale yellow; halteres yellow. Cell R_5 closed at the wing margin or just open; *m–cu* about at right-angles to *M* and about mid-way between *r–m* and the bend; costal spine very strong, equal in length to second costal sector and twice as long as *r–m*; costal spinules numerous and not very conspicuously enlarged; basal node of R_{4+5} with a strong setula and additional hair or two. Calyptrae pale yellow, colour less intense medially than elsewhere. Abdomen black with basal bands of silvery or greyish white pollinosity on T3–T5, the bands interrupted medially and less extensive on the dorsum than on the sides (pale pollinosity about a quarter to a third of length of intermediate tergites dorsally and over half length of these tergites laterally). Abdominal T3 with a pair of very strong erect median marginal setae and without discal setae; T4 with a pair of strong erect median discal setae; both intermediate tergites with long recumbent hairing. T7+8 forming a shining protuberant knob well visible in situ under T5 and the epandrium slightly enlarged, both epandrium and T7+8 with strong setae. Cerci and surstyli extremely slender and attenuate, subequal in length. Measurements: body length 4·2–5·5 mm (mean 4·7), wing length 3·5–4·5 mm (mean 4·0) [6 specimens].

♀. Extremely similar to ♂ but differing in wider frons (0·32 of head-width) and in having two pairs of proclinate orbital setae. Abdominal T5 rather strongly compressed into a vertical apical keel. Measurements: body length 4·6–5·6 mm (mean 5·0), wing length 4·0–4·5 mm (mean 4·2) [9 specimens].

MATERIAL EXAMINED. Holotype ♂, SOUTH AFRICA: Cape Province, Algoa Bay (=Algoabaai), 22.xi.1896 (*Brauns*), in Naturhistorisches Museum, Vienna. (The holotype is teneral and greasy, has lost the right mid and hind legs from the trochanters, lacks the left hind tarsus, and has the claws broken off.)

SOUTH AFRICA: 1 ♂, Cape Province, Port Elizabeth District, van Staadens Pass, 30.x.1964 (*B. & P. Stuckenberg*) (NMP); 3 ♂, Cape Province, Port Elizabeth, 29.x.1931 (*Miss A. Mackie*) (BMNH); 1 ♂, Cape Province, South West District (BMNH); 3 ♂, 7 ♀, Cape Province, Cape of Good Hope nature reserve, 7–10.iii.1968 (*P. Spangler*) (2 ♂, 6 ♀ USNM & 1 ♂, 1 ♀ BMNH); 2 ♀, Cape Province, Hout Bay, Skoorsteenkop, 18.xi.1951 (*Brinck & Rudebeck*) (BMNH); 1 ♀, Cape Province, Cape Point, 30.x.1954 (*C. H. Andrewes*) (BMNH).

AFFINITIES. *Rhinomorinia atra* is very closely allied to *R. capensis*, differing only by the features mentioned in the key. From *R. approximata* it differs by the much wider frons in the male and presence of prevertical setae, and from *R. setitibia* (to which it is certainly very close) it differs by lacking proclinate orbital setae in the male and by the absence of *pd* setae on the fore tibia.

***Rhinomorinia setitibia* sp. n.**

DESCRIPTION. ♂. Head ground colour black, except for subparafacials dark reddish brown, parafrontals and parafacials silvery grey pollinose, vertex yellowish grey pollinose on either side of the posterior part of the ocellar triangle; antennae black (with very slight trace of orange colour at junction of second and third segments); palpi yellow apically, darker yellowish brown or brown basally. Head higher than long, eye profile suboval and weakly oblique, epistome not very strongly warped forwards from face but nearly as prominent as profrons, upper occiput flat. Eyes very slightly approximated, frons at narrowest about 0·27 of head-width. One pair of strong proclinate orbital setae (standing almost in line between the uppermost frontal setae and the prevertical setae). Prevertical setae present (strong and rather reclinate), outer vertical setae absent. Parafacials very narrow, at mid point less than half as wide as third antennal segment, with a very few hairs at extreme upper ends. Upper occiput bare behind the postocular row. Antennae medium-sized, third segment falling well short of epistome and about 2·2 times as long as second segment; arista bare. Proboscis short. Thorax black with a pair of submedian silvery grey vittae on the prescutum, thick whitish pollinosity on humeral calli and notopleura, and thin whitish pollinosity on pleural regions. Two humeral setae. 1(+)+1 *acr* setae. Two *stpl* setae. Pteropleural seta well developed, slightly longer than notopleural setae. Infrasquamal hairs absent. Scutellum with strong apical setae (nearly as long as laterals), lateral setae inserted equidistantly between scutellar base and apical setae, *very* weak basal setae just differentiated. Legs black; claws moderately long. Fore tibia with a submedian *pd* seta and a preapical *pd* seta. Mid femur with two differentiated setae on the *a* surface. Mid tibia with two *ad* setae. Hind tibia with two *ad* setae and two *av* setae. Wings very faintly tinged yellowish brown; basicosta yellow; halteres yellow. Cell R_5 closed and with a small petiole about equal in length to *r–m*; *m–cu* at right angles to *M* but bent outwards medially so that the proximal angle formed with Cu_1 is conspicuously acute, *m–cu* meeting

M conspicuously nearer to *r–m* than to the bend; costal spine extremely strong, longer than second costal sector and about three times as long as *r–m*; costal spinules numerous and only very inconspicuously enlarged; basal node of R_{4+5} with one very large or enormous setula, with or without additional hair. Calyptrae white or yellowish. Abdomen black with narrow basal bands of white pollinosity on T3–T5, the pale pollinose bands interrupted medially on the intermediate tergites. Abdominal T3 with a pair of very strong erect median marginal setae; intermediate tergites each with one pair of strong erect median discal setae, and with recumbent hairing. T7 + 8 forming a shining protuberant knob projecting medially under T5 and epandrium very large, both T7 + 8 and epandrium with short strong setae. Cerci and surstyli long and narrow. Measurements: body length 4·0 mm, wing length 3·4 mm [2 specimens].

♀. Extremely similar to ♂ but differing by wider frons (0·32 of head-width) and in having abdominal T5 entirely shining black without pollinose band. One *av* seta on hind tibia and no discal setae on abdominal T3 in the one specimen seen but these features perhaps not constant.

MATERIAL EXAMINED. Holotype ♂, SOUTH AFRICA: Natal, Hluhluwe, 30.xi.1973, in British Museum (Natural History), London.

Paratypes. SOUTH AFRICA: 1 ♂, locality as holotype, 29.xi.1973 (*Zumpt*) (BMNH). MOZAMBIQUE: 1 ♀, Lourenço Marques, Raikatla, ix–xii.1913 (*H. A. Junod*) (BMNH).

AFFINITIES. This is the only Afrotropical species of *Rhinomorinia* having posterodorsal setae on the fore tibia, and the name *setitibia* alludes to this character. Nevertheless, the affinities of *setitibia* lie certainly with *R. atra*, the two species being nearly identical except for the characters mentioned in the foregoing key to males, the absence of pollinosity on the fifth abdominal tergite in the female of *setitibia*, and the chaetotactic difference in the fore tibiae already mentioned.

Rhinomorinia verticalis sp. n.

DESCRIPTION. ♂. Head ground colour black, except for subparafacials and subocular strips dark reddish brown; upper occiput and upper parts of parafrontals rather shining, lower parts of parafrontals and parafacials silvery white pollinose; antennae dark brown, partially suffused with paler reddish colouring on second segment and base of third; palpi tawny yellow. Head higher than long, eye profile broadly suboval and slightly oblique, vibrissal angles only weakly prominent, upper occiput very slightly swollen. Eyes very widely separated, frons at narrowest about 0·33 of head-width. One pair of very strong proclinate orbital setae (with or without one or two supernumerary proclinate setulae in addition). Prevertical seta present, very strong and directed conspicuously outwards; outer vertical setae present, strong. Parafacials moderately broad, at mid point slightly over half as wide as third antennal segment, sparsely stiff haired on upper halves. Upper occiput with irregular stiff black setulae behind the postocular row. Antennae small, not reaching epistome, third segment about 1·6 times as long as second segment; arista pubescent. Proboscis short. Thorax black, humeral calli and notopleura thinly grey pollinose and prescutum with a pair of short faintly marked submedian greyish vittae (these somewhat evanescent and not evident from all angles); pleural regions only noticeably grey pollinose on the propleura. Three humeral setae (a small but distinct inner seta present in addition to main two). *Acr* setae well differentiated, 1(+)+1(2). 2–3 *stpl* setae. Pteropleural seta weak. Infrasquamal hairs present or absent. Scutellum with extremely strong apical setae subequal in size to lateral setae, latter about equidistantly inserted between scutellar base and apical setae, basal setae undifferentiated. Legs black; claws medium-sized (slightly shorter than last tarsal segments). Fore tibia without submedian *pd* seta, with a small setula in the preapical *pd* position. Mid femur with two or three differentiated setae on the *a* surface. Mid tibia with one *ad* seta. Hind tibia with two *ad* and two *av* setae. Wings very faintly tinged yellowish brown; basicosta pale yellow; halteres orange-yellow. Cell R_5 closed and with a *very* short rudimentary petiole that is about half as long as *r–m* or slightly less; *m–cu* at right-angles to *M*, meeting *M* about mid-way between *r–m* and the bend; costal spine not very strong, shorter than second costal sector and not more than one-and-a-half times as long as *r–m*; costa without unusually strong spinules; basal node of R_{4+5} with one or two setulae, main one long but not unusually strong. Calyptrae translucent yellowish white. Abdomen black and partially shining, with grey or brownish grey pollinosity, the pollinosity mainly confined to the anterolateral parts of T3 and T4 but more diffuse and less obvious on T5. Abdominal T3 medially with long recumbent marginal hairs but without erect median marginal setae; intermediate tergites without discal setae and with recumbent hairing. T7 + 8 and epandrium without strong setae, latter not very large. Measurements: body length 3·3–3·4 mm, wing length 3·2–3·3 mm [2 specimens].

♀. Extremely like the ♂, with almost identical head.

Material examined. Holotype ♂, South Africa: Cape Province, George District, Outeniqua Pass, 24.x.1964 (*B. & P. Stuckenberg*), in Natal Museum, Pietermaritzburg.

Paratype. South Africa: 1 ♀, Cape Province, nr Oudtshoorn, x.1931 (*Miss A. Mackie*) (BMNH).

In addition to the two specimens cited above I have seen two specimens (one of each sex) from Natal that are probably this species, but which differ slightly from the Cape Province type-material and that I think it preferable to omit from the type-series. These specimens have the antennae more uniformly blackish brown than in the holotype and paratype, and the abdominal pollinosity is paler and formed into more distinct broad bands on the basal halves of the intermediate tergites. Their data are: 1 ♂, Natal, Drakensberg Mts, 1800 m [5800 ft], Giants' Castle Reserve, 1.xi.1972 (*M. E. Irwin*) (NMP); 1 ♀, Natal, Pietermaritzburg, 23.xi.1973 (*F. Zumpt*) (BMNH).

Affinities. Rather uncertain, but perhaps closest to *R. scutellata* with which it runs out in the foregoing key to females.

Rhinomorinia scutellata sp. n.

Description. ♀. Head ground colour blackish on occipital regions, parafrontals, parafacials and genal dilations, occiput and upper third of parafrontals rather shining (latter with brassy reflections), the parafacials and lower parts of parafrontals with silvery white pollinosity which changes in appearance with direction of the light (at certain angles an abrupt change in apparent colour at junction of parafacial and parafrontal); interfrontal area reddish brown; subparafacial areas and subocular strips reddish orange; face tawny yellowish; antennae brownish black; palpi yellow. Head higher than long, eye profile broadly suboval and oblique, epistome well warped forwards from face but a little less prominent than profrons, upper occiput flat. Eyes widely separated, frons about 0·35 of head-width. One pair of proclinate orbital setae. Prevertical setae present, outer vertical setae absent. Parafacials rather wide, at mid point almost as wide as third antennal segment, with some short stiff hairing on uppermost three-fifths. Upper occiput with black setulae behind the postocular row. Antennae medium-sized, third segment 1·9 times as long as second segment; arista micropubescent. Proboscis short. Thorax shining black with a pair of submedian white-pollinose vittae on the prescutum that do not quite reach the transverse suture but otherwise almost devoid of pollinosity (only thin traces of whitish pollinosity on pleural regions, especially propleura, and in some lights traces of dark greenish brown pollinosity in two pairs of incomplete lines on the scutum). Two humeral setae. *Acr* setae very weakly differentiated. Two *stpl* setae (third weakly differentiated on one side in specimen seen). Pteropleural seta strongly differentiated (about as long as or slightly longer than notopleural setae). Infrasquamal hairs absent. Scutellum with small apical setae that are slightly less than half as long as the lateral setae, the latter inserted equidistantly between the scutellar base and the apical setae, basal setae absent [apical setae directed upwards instead of horizontally in the one specimen (holotype) seen, the feature apparently natural but possibly due to derangement]. Legs black. Fore tibia without *pd* setae. Mid femur with a row of about seven well-differentiated setae along the *a* surface. Mid tibia with two *ad* setae. Hind tibia with two *ad* setae and two *av* setae. Wings very faintly smoky brownish; basicosta reddish yellow; halteres yellow. Cell R_5 closed at the wing margin; *m–cu* at right-angles to *M* and mid way between *r–m* and the bend; costal spine very strong, about as long as second costal sector and twice as long as *r–m*; first costal sector with unusually sparse enlarged spinules standing out erectly (third sector with smaller but also distinctly enlarged spinules); basal node of R_{4+5} with a small setula accompanied by one or two hairs. Calyptrae yellow. Abdomen shining black with slight brassy reflections in some lights, T3 and T4 with very thin and inconspicuous pale greyish or greenish grey pollinosity best seen as the fly is turned. Abdominal T3 without median marginal setae, intermediate tergites without discal setae and with short moderately dense recumbent hairing. Measurements: body length 4·3 mm, wing length 3·8 mm [1 specimen].

♂. Unknown.

Material examined. Holotype ♀, South Africa: Cape Province, Stellenbosch, 4.ix.1926 (*R. I. Nel*), in British Museum (Natural History), London. (Holotype lacking mid and hind legs of the left side from the trochanters.)

Affinities. Probably closely allied to *R. bisetosa* but differing by having one pair of proclinate orbital setae (♀), narrower interfrontal area, non-pollinose humeral calli and notopleura, and by lacking grey-pollinose vittae on the scutum. It is similar to *bisetosa* in lacking outer vertical setae (♀) and in having rather small apical scutellar setae. The holotype (only known specimen) is specially interesting because the apical scutellar setae, though crossed, are directed almost straight upwards in what appears to be a natural posture; the orientation of these setae on the holotype might, however, be due to accidental displacement, and only further material can show if the upward orientation is a natural feature of the species. If it is, then *R. scutellata* is the only Afrotropical species of rhinophorid with upright apical scutellars.

Rhinomorinia bisetosa sp. n.

DESCRIPTION. ♂. Head ground colour blackish on parafrontals, parafacials, genal dilations and posterior surface but obscured by rather thick greyish white or ashy pollinosity; interfrontal area reddish orange on anterior third and dark reddish brown on the posterior two-thirds (colour transition usually rather gradual), subparafacial areas and facial ridges yellowish orange (especially when seen from below); antennae blackish brown except bases of third segments narrowly yellow-orange; palpi yellow. Head higher than long, eyes rather broadly subovate in profile, facial profile long and vibrissal angles moderately strongly prominent. Eyes not approximated, frons very wide and about 0·375 of head-width. Two pairs of proclinate orbital setae present. Prevertical setae present, outer vertical setae absent. Parafacial at mid point about half as wide as third antennal segment, with a few stiff hairs on uppermost quarter or two-fifths. Upper occiput with long fine sparse setulae behind the postocular row. Antennae long and heavy, third segment about 2·4 times as long as second segment and almost reaching the epistome; arista micropubescent. Proboscis short. Thorax black with pale grey pollinosity on pleural regions, thick greyish white pollinosity on humeral calli and notopleura, and with a pair of complete silvery or greyish pollinose vittae on prescutum and scutum (the vittae more or less reaching the scutellum); scutellum all black. Two humeral setae (weak innermost third sometimes differentiated). *Acr* setae undifferentiated or represented by weak setulae. Two or three *stpl* setae. Pteropleural seta well differentiated (almost as large as notopleural setae). Infrasquamal hairs absent or very few and minute. Scutellum with weak apical setae that are slightly less than half as long as the lateral setae, basal setae absent. Legs black; claws of medium length. Fore tibia without *pd* setae. Mid tibia with one or two *ad* setae. Hind tibia with two *ad* setae and two *av* setae. Wings very faintly brownish to naked eye, the veins yellowish basally; basicosta pale yellow; halteres orange-yellow. Cell R_5 varying from narrowly open to closed at wing edge to very short-petiolate (if trace of petiole present, as in holotype, then not longer than half of *r–m*); *m–cu* at right-angles to *M* and about mid way between *r–m* and the bend; costal spine not very strong, shorter than second costal sector and less than twice as long as *r–m*; spinules of first costal sector numerous and not noticeably enlarged or erect; basal node of R_{4+5} with inconspicuous hairs or setulae. Calyptrae yellowish white. Abdomen black with conspicuous greyish white pollinosity on anterior halves of T3, T4 and T5, pollinosity absent medially on the tergites and the pale-pollinose bands interrupted on the mid-part of the abdomen. T3 without median marginal setae, both T3 and T4 without discal setae, hairing recumbent. Measurements: body length 3·0–3·3 mm, wing length 2·7–2·9 mm [4 specimens].

♀. Extremely like the ♂ but with much narrower white-pollinose banding on intermediate tergites and with T5 entirely shining black (lacking a pale pollinose band).

MATERIAL EXAMINED. Holotype ♂, SOUTH AFRICA: Cape Province, Bredasdorp District, Arniston coastal dunes, 22–23.x.1964 (*B. & P. Stuckenberg*), in Natal Museum, Pietermaritzburg.

Paratypes. 3 ♂, 7 ♀, same data as holotype (♂ & 2 ♀ in BMNH, remainder in NMP, Pietermaritzburg).

AFFINITIES. A distinctive species easily recognized by the colour of the interfrontal area in conjunction with the presence of two pairs of proclinate orbital setae (to which character the specific name alludes), and perhaps most closely allied to *R. xanthocephala* (with which it agrees, for example, in having unusually small apical scutellar setae, outer vertical setae and broad male frons with both prevertical and proclinate orbital setae).

Rhinomorinia xanthocephala (Bezzi) comb. n.

Hoplisa xanthocephala Bezzi, 1908 : 187; Villeneuve, 1916 : 511. LECTOTYPE ♂, by present designation, SOUTH WEST AFRICA (MNHU, Berlin) [examined].

Hoplisa novicia Villeneuve, 1916 : 511; Zumpt, 1959 : 432. LECTOTYPE ♂, by present designation, SOUTH AFRICA (SAM, Cape Town) [examined]. **Syn. n.**

LECTOTYPE DESIGNATIONS. (1) *xanthocephala*. This species was described from four ♂ and two ♀ syntypes in alcohol, all with the same data and collected at Rooibank, South West Africa. Two ♂ syntypes have been located, both in Museum für Naturkunde der Humboldt-Universität, Berlin, both in alcohol and both in damaged and faded condition after long preservation in spirit. The two syntypes are conspecific. They have been placed in separate tubes, one labelled (and here designated) as lectotype and the other labelled as paralectotype; a slide preparation has been made of the genitalia from the paralectotype.

(2) *novicia*. This nominal species was described from two 'examples' from Barberton in the Transvaal and stated to be in the South African Museum, and from one 'example' in the 'Hofmuseums' (i.e. Naturhistorisches Museum), Vienna. Three specimens have been located that are believed to be the whole type-series, although none of them is clearly and unequivocally labelled as being a 'type' (however, this is not unusual with Villeneuve's earlier work); all are males. One specimen exists in the SAM, Cape Town, collection and is here designated as lectotype: it bears a white label with the words 'Barberton Transv.' in black ink and a faded blue label with the words 'Hoplisa novicia Villen.' in black ink in Villeneuve's writing. The second specimen is from the NM, Vienna, collection and is labelled 'Cap b. sp. Coll. Winthem', 'capensis i. litt. det. B.B.' (both labels partly handwritten, partly printed), and 'Hoplisa capensis n. sp. (det. Villeneuve)', the last being one of Villeneuve's usual blue labels with his black ink handwriting. Villeneuve never published the name 'Hoplisa capensis' but the specimen bearing this label is believed to be the '1 example, Hofmuseums, Vienna' mentioned in Villeneuve's description of *novicia* (it is inferred that Villeneuve originally intended to call his species 'capensis' but changed his mind and published it as *novicia*, without remembering or having an opportunity to re-label the specimen). The third specimen is in the BMNH collection, has a black ink label reading 'Barberton Transvaal' and another label with the words 'Hoplisa novicia Villen. Villeneuve det.' in what appears to be van Emden's handwriting; there is no evidence as to how the BMNH acquired this specimen, and its type-status is not completely certain, but it is accepted as an original syntype in the absence of contrary evidence. The NM, Vienna and BMNH specimens have been labelled as paralectotypes and a slide preparation has been made of the genitalia of the BMNH specimen. Zumpt (1959) erroneously stated that there was no type-material of *novicia* in the South African Museum.

DESCRIPTION. ♂. Head ground colour blackish or dark greyish on occipital region, parafrontals, ocular margins of the parafacials, postbuccae and posterior parts of genal dilations, and yellow or reddish yellow on face, facial margins of parafacials, subparafacial areas, epistome and anterior parts of genal dilations; interfrontal area orange-yellow, rarely dark brown on upper parts against the parafrontals; most of head with thin whitish pollinosity, the pale pollinosity overlying the dark parafrontals giving the parafrontals a dark slaty grey or even slightly bluish grey appearance in strong contrast to the orange-yellow interfrontal area; antennae dark brown with apices of second segments and bases of third segments yellowish brown or orange; palpi yellowish. Head almost as long as its height (shape as Fig. 8), eye profile almost subcircular, epistome extremely strongly warped forwards from the face and very sharp, upper occiput distinctly swollen. Eyes very widely separated, frons about 0·43 of head-width. One pair of very strong proclinate orbital setae. Prevertical setae present, strong and directed conspicuously outwards; outer vertical setae present, strong. Parafacials slightly narrower than third antennal segment, with sparse stiff hairs on most of their height. Upper occiput with sparse setulae behind the postocular row. Genal dilation with a very strong seta on the anteroventral corner. Antennae rather heavy, reaching nearly to the epistome, third segment about twice as long as second; arista pubescent. Proboscis slightly elongate. Thorax black with a pair of large continuous pale ashy grey pollinose vittae on the dorsum, similar thick pale grey pollinosity on humeral calli and notopleura, and thin greyish white pollinosity on pleural regions; dark areas of thoracic dorsum appearing brassy-brownish pollinose in certain lights. Two humeral setae. *Acr* setae variable, usually 1+1 pairs differentiated, sometimes undeveloped or developed haphazardly on the prescutum. Two *stpl* setae, occasionally the lowermost (third) seta weakly differentiated. Pteropleural seta weak, smaller than notopleural setae. Infrasquamal hairs usually absent. Apical scutellar setae extremely weak or even hair-like, much less than half as long as lateral setae, the lateral setae inserted higher than usual on sides of the scutellum and closer to the apical setae than to scutellar base; basal setae absent. Legs black; claws medium-sized (slightly shorter than last tarsal segment). Fore tibia without *pd* setae. Mid femur with a row of four or more strong setae on the *a* surface. Mid tibia with two *ad* setae. Hind tibia with two *ad* setae and two *av* setae (proximal *av* seta sometimes minute). Wings hyaline or at most with a faint trace of yellowish brown colour; basicosta pale yellow; halteres yellow. Wing venation as Fig. 22: cell R_5 usually narrowly open but sometimes just closed at wing margin (no trace of petiole); *m–cu* at right-angles to *M* but sometimes slightly oblique in relation to Cu_1 so that the inner angle with Cu_1 is acute; *m–cu* meeting *M* mid way between *r–m* and bend or slightly nearer to *r–m*; costal spine extremely strong, much longer than second costal sector and usually about three times as long as *r–m*; costa with unusually sparse strong and outstanding spinules, especially on first sector; basal node of R_{4+5} with a very strong setula, usually accompanied by smaller setulae. Calyptrae creamy white or creamy yellowish. Abdomen black with conspicuous bands of silvery grey pollinosity on basal halves of T3–T5, the pale bands on T3 and T4 narrowly interrupted medially and sometimes indefinite on T5. Abdominal T3 with a pair of extremely long strong erect median marginal setae; intermediate tergites with long recumbent hairing, T4 with a pair of short fine erect median discal setae (occasional specimen with the discals of T4 moderately strong and then a pair of discals also on T3). T7 + 8 and epandrium with strong setae, latter not very large; cerci and surstyli long and narrow, subequal in length; ejaculatory sclerite moderately large and fan-shaped. Measurements: body length 2·9–3·8 mm (mean 3·2), wing length 2·4–3·3 mm (mean 2·8) [10 specimens].

♀. Extremely similar to ♂, but last visible abdominal tergite (T5) appearing entirely shining black from above (pale pollinosity present only on the anteroventral parts of the tergite). Discal setae of T4 sometimes extremely small. Measurements similar to ♂.

MATERIAL EXAMINED. Lectotype ♂ of *xanthocephala*, SOUTH WEST AFRICA: Rooibank, nr Walvis Bay, v.1905 (*L. Schultze*), in Museum für Naturkunde der Humboldt-Universität, Berlin. Lectotype ♂ of *novicia*, SOUTH AFRICA: Transvaal, Barberton (no other data), in South African Museum, Cape Town.

SOUTH AFRICA: 1 ♂, Transvaal, Barberton (paralectotype of *novicia*) (BMNH); 1 ♀, Orange Free State, North Banks Halt, Norvals Point, 14.iv.1934 (*J. Ogilvie*) (BMNH); 1 ♀, Natal, Durban, 14–18.x.1931 (*J. Ogilvie*) (BMNH); 3 ♂, 4 ♀, Natal, Zululand, St Lucia, coastal dunes, 8 m, 2832 Ad, 24.xi.1971 (*M. E. & B. J. Irwin*) (2 ♂, 3 ♀ NMP, 1 ♂, 1 ♀ BMNH); 1 ♂, Cape Province, Oudtshoorn, x.1931 (*Miss A. Mackie*) (BMNH); 1 ♂, Cape Province, Mossel Bay, xii.1934 (*R. E. Turner*) (BMNH); 1 ♀, Cape Province, Cape Town, Kloof Nek, 1–2.i.1972 (*B. H. Cogan*) (BMNH); 1 ♀, Cape Province, Port Elizabeth, x.1931 (*Miss A. Mackie*) (BMNH); 1 ♀, Cape Province, Clanwilliam District, Pakhuis Pass, 950 m, 17–19.x.1964 (*B. & P. Stuckenberg*) (NMP); 4 ♂, Cape Province, East London, coastal dunes, 5 m, 3237 Dd, 16.iii.1972 (*M. E. & B. J. Irwin*) (3 ♂ NMP, 1 ♂ BMNH); 1 ♀, Cape Province, Calvinia District, Brandkop, 14.x.1964 (*B. & P. Stuckenberg*) (NMP); 3 ♂, 1 ♀, Cape Province, South-West Cape, Atlantic coast, 20.x.1964 (*B. & P. Stuckenberg*) (2 ♂, 1 ♀ NMP, 1 ♂ BMNH); 1 ♂, 2 ♀, Cape Province, Cape of Good Hope nature reserve, 7–10.iii.1968 (*P. Spangler*) (USNM); 3 ♂, 1 ♀, Cape Province, Bradesdorp District, Arniston coastal dunes, 22–23.x.1964 (*B. & P. Stuckenberg*) (2 ♂, 1 ♀, NMP, 1 ♂ BMNH); 11 ♂, 5 ♀, Cape Province, South-West Cape, Strandfontein, coast west of Van Rhynsdorp, 15–17.x.1964 (*B. & P. Stuckenberg*) (8 ♂, 4 ♀, NMP, 3 ♂, 1 ♀, BMNH); 1 ♂, Cape Province, 'Cap b. sp.' (NM, Vienna). SOUTH WEST AFRICA: 1 ♂, Rooibank, nr Walvis Bay, v.1905 (*L. Schultze*) (paralectotype of *xanthocephala*) (MNHN).

VARIATION AND SYNONYMY. *Rhinomorinia xanthocephala* as here accepted is slightly variable, and it is possible that it is not one species but a complex of two or more semi-sibling species. The interfrontal area is wider in some specimens of the same sex than others, and occasionally the upper part of the interfrontal area against the parafacials is dark brown instead of uniformly orange-yellow. The parafacials vary somewhat in width, and are sometimes almost entirely yellow instead of dark greyish against the eyes and yellow against the facial ridges; the extent of hairing on the parafacials is also variable. Variation in antennal size occurs, some specimens having much heavier antennae than others but not being noticeably different in the proportions of the third and second segments. The thorax, legs and wings are fairly constant, though slight differences occur in the wing venation between different specimens (especially regarding the point at which *m–cu* joins *M* in relation to *r–m* and the bend and its degree of obliqueness in relation to Cu_1). The extent of pale pollinosity on the abdomen, especially in the male, varies, some specimens having the silvery or grey pollinosity confined to about the basal third of each intermediate tergite and others having it much more extensive. The male genitalia are confusing, and the exact shape of the surstyli and cerci is rather variable. In most specimens examined the cerci taper rather regularly towards their apices and are generally very narrow seen from behind, but in some specimens the cerci in posterior view are broader and rather suddenly contract at the apices (suggesting that two species might be involved); the surstyli in profile are usually rather parallel-sided, but in occasional specimens are clearly wider at the base than towards the apex.

No obvious correlation has been found in the variables just mentioned, and I am unable on present evidence to decide whether more than one species is involved. More critical study of longer series (when these are available), perhaps with host data, will be needed to decide this, but I consider it justified at this stage to synonymize *novicia* with *xanthocephala*. The primary types of these names agree closely with each other, and the cerci in both are of the rather evenly tapering kind, so that even if *xanthocephala* is found to be a mixture of species it appears that *novicia* will remain a synonym of *xanthocephala*. Villeneuve (1916) distinguished his *novicia* from *xanthocephala* on head shape and colour but I am not able to substantiate these differences from direct comparison of types (though admittedly the type-material of *xanthocephala*, after long preservation in alcohol, is badly decolorized). As far as shape is concerned, I find this to vary more than usual with condition of the material (whether teneral or not), and attach no significance to the apparent difference between *novicia* and *xanthocephala* that Villeneuve mentioned. The chaetotaxy of the two is identical, including the presence in both types of the unusually strong peristomal seta inserted on the anteroventral corner of the genal dilation that is such a conspicuous feature of this species.

AFFINITIES. A distinctive species easily recognized by the orange-yellow interfrontal area and largely yellow head, continuous pale vittae on thoracic dorsum, and the enormous costal spine and sparse enlarged costal spinules (especially on the first costal sector). Perhaps fairly closely allied to *R. bisetosa*.

Rhinomorinia vittata (Brauer & Bergenstamm) **comb. n.**

Oxytachina vittata Brauer & Bergenstamm, 1891 : 369 (65) (attrib. Wiedemann); Townsend, 1935 : 252; Townsend, 1938 : 196. Holotype ♀, SOUTH AFRICA (NM, Vienna) [examined].

DESCRIPTION. ♀. Head ground colour blackish on posterior surface, frons, parafacials and genal dilations, reddish orange on subparafacials, subocular strips and the face, tawny yellowish at the epistome; head rather thickly yellowish white pollinose, especially on parafrontals and parafacials; antennae with second segments reddish brown, third segments dark brown with extensive bright orange colouring basally on the inner surface; palpi yellow. Head shape as Fig. 9, eye profile broadly suboval, epistome prominent but rather blunt, upper occiput conspicuously swollen. Eyes very widely separated, frons 0·41 of head-width. Two pairs of proclinate orbital setae. Prevertical and outer vertical setae present (latter rather weak). Parafacials very broad, at mid point appreciably wider than third antennal segment, with some stiff hairs on about upper third. Upper occiput with large black setulae behind the postocular row. Antennae medium-sized, third segment about 1·6 times as long as second segment; arista micropubescent. Proboscis slender, conspicuously elongated and tapering, a little longer than height of the head (Fig. 9), palpi also longer than usual. Thorax brownish black with the ground colour largely obscured by thick pale greyish yellow pollinosity, the pollinosity covering the pleural regions, humeral calli and notopleura, median two-thirds of the scutellum, and forming a pair of very broad continuous vittae on prescutum and scutum which join each other posteriorly just before the scutellum (distribution of pale pollinosity giving thorax the appearance of having a median and paired sublateral brownish black broad vittae and a black-margined scutellum). Three humeral setae. 1 + 1 *acr* setae. Three *stpl* setae (lowermost one just differentiated). Pteropleural seta weak and smaller than notopleural setae. Infrasquamal hairs present but very minute and inconspicuous. Scutellum with strong apical setae [missing on holotype but large pores evident], lateral setae inserted equidistantly between scutellar base and apical setae, basal setae absent. Legs blackish brown. Fore tibia without *pd* setae. Mid femur with an interrupted row of about four or five setae well differentiated on the *a* surface. Mid tibia with two *ad* setae. Hind tibia with two *ad* and two or three *av* setae. Wings almost hyaline, veins reddish yellow; basicosta pale yellow; halteres yellow. Cell R_5 just closed at wing margin; *m–cu* conspicuously oblique in relation to *M*, joining *M* nearer to the bend than to *r–m*; costal spine very strong, as long as second costal sector and nearly three times as long as *r–m*; spinules of first costal sector distinctly enlarged; basal node of R_{4+5} with a very strong setula accompanied by one or two hairs. Calyptrae creamy white. Abdomen brownish black extensively covered with pale yellowish to greyish yellow pollinosity, pollinosity only missing from apical half of T5, and the posterior parts and mid-line of T3 and T4 (but boundary between pale pollinose basal parts and shining brownish black apical parts of T3 and T4 dorsum not very sharply defined). Measurements: body length 7·2 mm, wing length 5·6 mm [1 specimen].

♂. Unknown.

MATERIAL EXAMINED. Holotype ♀, SOUTH AFRICA: Cape Province, Cape of Good Hope, in Naturhistorisches Museum, Vienna.

The holotype is the only known specimen. It was part of von Winthem's collection and bears a label reading 'vittata 126. Cap b. sp. Coll. Winthem' (the words coll. Winthem printed, remainder in black ink script). Villeneuve evidently saw the specimen, though he apparently did not publish on it, for it also has a blue rectangular Villeneuve label reading 'Oxytachina Dr Villeneuve det. ead. nom.' (the words Dr Villeneuve det. printed, remainder in black ink in Villeneuve's hand). The condition is good except for a tear near the base of the right wing and loss of a few head bristles and the apical scutellar bristles.

AFFINITIES. Not certain and it is difficult to suggest which species are the nearest relatives of *vittata*. Brauer & Bergenstamm's name is specially apt, as the extent of the pale pollinosity on the thoracic dorsum gives the fly the impression of being trivittate (with three broad black lines separated by pale areas). This patterning is unique in the genus, as also are the unusually attenuate proboscis, and the pale-vittate scutellum. The lower anterior corner of the genal dilation bears a very strong seta similar to that occurring in this position in *R. xanthocephala*, and the first costal sector has obviously enlarged spinules approaching the kind found in *xanthocephala*, and *vittata* might be closer phyletically to *xanthocephala* than the obviously very different general facies would suggest.

Genus *PHYTO* Robineau-Desvoidy

Phyto Robineau-Desvoidy, 1830 : 218. Type-species: *Phyto nigra* Robineau-Desvoidy, 1830 [=*Tachina melanocephala* Meigen, 1824], by designation of Robineau-Desvoidy (1863 (2) : 48).

Styloneuria Brauer & Bergenstamm, 1891 : 365 (61). Type-species: *Styloneuria manni* Brauer & Bergenstamm, 1891 [=*Phyto adolescens* Rondani, 1861], by original designation and monotypy ('gen. n., sp. n.' situation).

Britea Curran, 1927 : 127. Type-species: *Britea tachinoides* Curran, 1927, by original designation. **Syn. n.**

Other synonyms: several other generic synonyms (see Herting, 1961).

DIAGNOSIS. Head shape slightly varied, Afrotropical forms as Figs 11 & 16. Eyes narrowly suboval to subcircular in outline, usually oblique; gena large, its depth much greater than antennal width. Epistome very weakly to strongly warped forwards from the face, facial profile nearly straight to conspicuously concave. Vibrissal angles usually weak, occasionally prominent, usually slightly less prominent than the profrons; vibrissae inserted below lowermost point of the eye, but well above lowermost point of the head. Eyes of ♂ either widely separated as in ♀ or approximated, often so strongly approximated that frons at narrowest point not as wide as the antenna. ♂ with or without proclinate orbital setae, with or without prevertical setae, and with or without outer vertical setae. Parafacials of varied width but well visible in profile, wholly or partially haired (hairing very sparse or virtually absent in occasional specimen). Antennae small or medium-sized, usually falling far short of epistome; arista bare to plumose. Proboscis of varied length, usually short but as long as or longer than head height in some Afrotropical forms. Pre-alar seta strong, about as large as or larger than notopleural setae (except in *P. pauciseta* Herting). Presutural *acr* setae present. Lower prostigmatic seta hair-like or virtually absent. Pteropleural seta small or completely undifferentiated. Barette usually haired, especially anteriorly, sometimes bare. Apical scutellar setae strong, slightly smaller than to stronger than lateral setae, scutellum often with a pair of basal setae in addition (laterals themselves sometimes inserted close to scutellar base). Mid tibia with one or more *ad* setae. Hind tibia with two or more *ad* setae, one or two *av* setae and a *pv* apical seta. Wing venation as or usually similar to Fig. 23: cell R_5 narrowly open or closed in wing margin or short-petiolate (if petiole present then at most about half as long as *m–cu*); bend of vein *M* usually rather abrupt but sometimes gently and evenly curved, the change of direction always widely obtuse (as Fig. 23); *m–cu* straight to moderately strongly sinuous, usually distinctly oblique in relation to *M* but sometimes at right-angles; basal node of R_{4+5} setulose or bare; costal spine absent to strong. Abdomen with or without discal setae; abdominal T1+2 with or without median marginal setae. ♂ genitalia with long narrow cerci and surstyli (subequal in length in species examined).

DISTRIBUTION. Palaearctic Region, eastern and southern Africa. Known distribution mainly southern European, but genus occurs northwards to England and eastwards to the Middle East, and occurs in North Africa and Canary Islands.

HOSTS AND EARLY STAGES. Species of *Phyto* attack woodlice of the genera *Oniscus* Linnaeus, *Porcellio* Linnaeus and *Armadillidium* Brandt & Ratzeburg. Thompson (1934) records *P. melanocephala* as attacking *Porcellio scaber* L., and *P. discrepans* Pandellé as attacking *P. scaber* L. and *Oniscus asellus* L., and cites Donisthorpe as having reared *P. melanocephala* from *Armadillidium vulgare* Latreille [Thompson's reference to Donisthorpe is incomplete and I have been unable to trace the original]. Early stages of *P. melanocephala* and *P. discrepans* are described by Thompson (1934) and Bedding (1973).

DISCUSSION. This genus, along with *Stevenia* Robineau-Desvoidy, is one of the largest genera of Rhinophoridae, and Herting (1961) recognizes 12 species, all confined to the Palaearctic Region. But the genus *Phyto* certainly occurs in the Afrotropical Region also, and in the present work I assign to it one previously described East African species and four new species (two of the latter rather doubtfully, as discussed below).

The previously described Afrotropical species that unquestionably belongs in *Phyto* is *Britea tachinoides* Curran, a valid species that Curran (1927) originally described in the Sarcophagidae and that is type-species of the nominal genus *Britea* Curran described at the same time. However, *Britea tachinoides* is obviously not a sarcophagid, and this was known to Townsend and Villeneuve not long after its description. Townsend (1931 : 384) reported that *Britea* was 'close to *Paramorinia*, BB', and this statement clearly implied its rhinophorid affinities, as *Paramorinia* Brauer & Bergenstamm is synonymous with *Phyto* (see, for example, Herting, 1961): Townsend's (1935: 260; 1938 : 218) later placements of *Britea* as a (valid) genus of Moriniini also imply assignment to the group now termed Rhinophoridae.

Villeneuve (1932 : 272), in an easily overlooked 'tail-piece' comment to a paper on Formosan Tachinidae (!), unambiguously placed *Britea* in rhinophorids and by implication synonymized this generic name with *Styloneuria* Brauer & Bergenstamm, also by implication establishing a combination *Styloneuria tachinoides* (Curran). Villeneuve's remark is worth full quotation, as follows: 'En effet, cette espèce [*Britea tachinoides*] est identique à *Styloneuria maculosa* Villen. in litt., elle appartient donc aux Rhinophorinae de la tribu *Phyto*. Le genre *Styloneuria* B. B. est demeuré méconnu des auteurs américains. La première cellule postérieure de l'aile peut être ouverte, fermée ou pétiolée dans ce genre.' (Villeneuve's specific name *maculosa* was never, in fact, separately published and this name remains an unavailable name first published as a synonym with *tachinoides*.)

Herting (1961) treats both *Paramorinia* and *Styloneuria* as synonyms of *Phyto*, and I completely agree with this treatment. Villeneuve was correct to place *Britea tachinoides*, type-species of *Britea*, in *Styloneuria*, and the species now assigns to *Phyto* in view of the synonymy of *Styloneuria* with *Phyto*. Hence *Britea* is here treated as a new synonym of *Phyto*, and the new combination of *Phyto tachinoides* is formally established. (Herting did not deal with *Britea*.)

P. tachinoides is a species of *Phyto* with extremely strongly approximated eyes in the male and exceptionally long fine bristling and hairing. Other similar previously undescribed species occur in tropical and southern Africa; two are newly described here on the basis of specimens in the BMNH collection, and both of them are undoubtedly assignable to *Phyto*.

In addition I have seen three female specimens from the Natal Museum belonging to two distinct but closely allied species that are more doubtfully assignable to *Phyto*. Both species are new and justify description, but I am not fully certain that they ought to be placed in *Phyto*. However, there is no other suitable existing genus and I prefer to describe them in *Phyto* rather than erect a new genus for them, for they certainly possess many of the principal characteristics of *Phyto*. The head is rather longer and more strongly swollen occipitally, the eyes more subcircular and the proboscis more elongate (Fig. 11) than is typical of *Phyto*, but most other features (including the large pre-alar seta) are those of *Phyto*. It appears best to place these two new species in *Phyto* as an interim measure, until they can be better assessed in the light of more material and of males (male sex unknown at present).

Finally here it may be of interest to note that to confirm the generic placement of *tachinoides* Curran in *Phyto* I have examined the male hypopygium; it is extremely similar to that of *Phyto melanocephala*, type-species of *Phyto*, and confirms beyond doubt the congenericity of the two species, and therefore the synonymy of *Britea* with *Phyto*.

Key to Afrotropical species of *Phyto* Robineau-Desvoidy

[*Note*. The key cannot be complete as three of the species are known only from males and two only from females.]

1 Males 2

– Females 4

2 Prescutum and scutum with conspicuous pattern, median third of prescutum and its hind margin and posterior third or two-fifths of scutum thickly pale yellowish pollinose (pale pollinose areas strongly contrasting with black sublateral areas of prescutum and anterior part of scutum). Three *stpl* setae. Three humeral setae (in triangle). Interfrontal area obliterated at narrowest point of frons by contiguous parafrontals, frons at narrowest point not more than 0·065 of head-width. Arista distinctly plumose. Parafacial well visible in profile. Usually three *post ia* setae, median one (or anterior one if only two present) as close to or closer to hindmost one than to transverse suture. [East Africa] 3

– Prescutum and scutum without such pattern, brownish black except for a pair of narrow silvery greyish pollinose vittae on the prescutum (the vittae lying between the *dc* and *acr* setae and separated by a black median vitta). Two *stpl* setae. Two humeral setae. Interfrontal area distinct on whole height of the frons, parafrontals not juxtaposed, frons at narrowest point about 0·08 of head-width. Arista long-pubescent. Parafacial narrow and only just visible on lower part in profile. Two strong *post ia* setae, anterior one closer to transverse suture than to hindmost one. [South Africa]. . . . . . . ***P. parafacialis*** sp. n. (p. 43)

3 Arista long-plumose, hairing equally long on upper and lower surfaces and the longest hairs longer than the width of the frons at its narrowest point. Head ground colour entirely blackish, the subparafacial areas and interfrontal area velvety black (not paler than rest of the head). Abdominal T3 and T4 with the dark colour extending forwards as an elongate blackish brown triangle on each tergite that has its apex at the anterior margin (separating the pale pollinose basal parts of the tergites into two). Dorsal hairing of abdominal T3 and T4 very long, fine and erect; T3 without discal setae [? constant]. Frons at narrowest point much narrower than third antennal segment, not more than twice as wide as anterior ocellus (0·055 of head-width). . . . . ***P. paratachinoides*** sp. n. (p. 43)

– Arista short-plumose, hairing not as long on lower surface as upper surface and the longest hairs obviously shorter than the width of the frons at its narrowest point. Head not entirely black, the subparafacial areas and the interfrontal area orange-red, brick-red or reddish brown (paler than rest of the head). Abdominal T3 and T4 with the dark areas slightly triangular but not extending forwards in the mid line to the anterior margins of the tergites (bases of the tergites therefore with uninterrupted broad pale pollinose fasciae). Dorsal hairing of abdominal T3 and T4 short and recumbent or virtually so; T3 with one pair of long erect discal setae. Frons at narrowest point only slightly narrower than third antennal segment, conspicuously more than twice as wide as anterior ocellus (0·065 of head-width) ***P. tachinoides*** (Curran) (p. 42)

4 Proboscis very long and slender, much longer than the height of the head (Fig. 11). Interfrontal area exceptionally broad, about 2·6 times as wide as a parafrontal; frons correspondingly broad, its width about 0·43 of head-width. . . . . ***P. longirostris*** sp. n. (p. 44)

– Proboscis slightly elongate but not exceptionally attenuate, subequal in length to the height (and length) of the head. Interfrontal area not exceptionally broad, about 2·0 times as wide as a parafrontal; frons correspondingly narrower, its width about 0·37 of head-width ***P. stuckenbergi*** sp. n. (p. 44)

Certain characters mentioned in the species descriptions that follow are common to all the Afrotropical species. It is nevertheless thought useful to cite them in order to facilitate comparison with European species. For example, some European species possess posterodorsal setae on the fore tibia (other than the preapical one), whereas these are absent in known Afrotropical species, and this fact is therefore stated in the description of each species.

Phyto tachinoides (Curran) **comb. n.**

Britea tachinoides Curran, 1927 : 128; Townsend, 1931 : 384; Villeneuve, 1932 : 272; Townsend, 1935 : 260; Townsend, 1938 : 218; Zumpt, 1956 : 176 (wrongly placed in Tachinidae). Holotype ♂, Kenya (BMNH, London) [examined].

Styloneuria tachinoides (Curran) Villeneuve, 1932 : 272 (implied combination).

Styloneuria maculosa Villeneuve, 1932 : 272. Unavailable name, first published as a synonym.

Description. ♂. Ground colour of head mainly blackish but orange-red, brick red or dark reddish brown on subparafacial areas and interfrontal area; parafrontals and parafacials thickly pale yellowish pollinose, appearance shifting strongly with direction of light, face and genae thinly whitish pollinose; antennae and palpi blackish brown. Head shape as Fig. 16, conspicuously higher than broad, eye suboval and oblique, upper occiput flat. Eyes extremely strongly approximated, frons at narrowest point slightly narrower than third antennal segment (0·065 of head-width) and parafrontals just meeting so as to obliterate interfrontal area for a short distance. Outer vertical setae, prevertical setae and proclinate orbital setae absent. Ocellar setae long and moderately strong. Parafacials moderately broad, at mid point about equal in width to antenna and broadly visible in profile, sparsely haired (position of hairing variable). Antennae short, third segment about 1·75 times as long as second; arista short-plumose, plumosity longest on upper surface but longest hairs no longer than narrowest point of frons. Proboscis very short. Thoracic ground colour entirely brownish black, pleural regions uniformly covered with yellowish white pollinosity, dorsum with boldly marked pattern formed by contrasting dark non-pollinose and pale pollinose areas: prescutum thickly pale yellowish or greyish yellow pollinose on median third and against the hind margin, scutum similarly pale pollinose on about posterior two-fifths, humeral calli and notopleura also thickly pale yellowish pollinose (black and pale yellowish pattern reminiscent of *Trigonospila* in Tachinidae). Three humeral setae (in triangle). Two pairs of presutural *acr* setae. Usually three *post ia* setae with anterior one very fine, first sometimes absent, middle one at least as far from transverse suture as from hindmost one. Three *stpl* setae. Pteropleural seta very long but fine. Barette sparsely fine haired, at least anteriorly. Infrasquamal hairs rather long, abundant and conspicuous. Mesonotal hairing long fine and erect, but not very dense. Scutellum with fine weak basal setae and with lateral setae standing much closer to scutellar base than to apical setae. Legs blackish brown; claws very long. Fore tibia without submedian *pd* setae, with small *pd* preapical seta. Mid tibia with one *ad* seta. Hind tibia with three (+) *ad* setae and with one *av* seta. Wings hyaline or virtually so; basicosta blackish brown; halteres yellow. Wing venation as Fig. 23, cell R_5 narrowly open before the wing tip, bend of *M* very widely obtuse but slightly abrupt and about as far from wing edge as from *m–cu*, latter strongly oblique in relation to *M* and rather strongly sinuous; costal spine undifferentiated; basal node of R_{4+5} with long fine hairs (usually from two to four). Calyptrae glassy yellowish white. Abdominal ground colour black, largely obscured on T3–T5 by thick yellowish white or pale greyish yellow pollinosity, T3 and T4 with dark hind margins and extensively dark and non-pollinose in a large median subtriangular area extending forwards from the dark hind margins (pale pollinosity therefore much less extensive medially than laterally), T5 mostly pollinose and only narrowly blackish brown posteriorly. Abdominal T1+2 without median marginal setae, T3 with median marginal setae; T3–T5 each with a pair of strong median discal setae (occasionally duplicated); dorsal hairing of intermediate tergites recumbent or almost so. Postabdomen with T6 well developed, T6 and T7+8 with long fine setae, epandrium without setae among the hairing. ♂ genitalia with long narrow cerci and surstyli, and with large fan-shaped ejaculatory sclerite. Measurements: body length 7·2–8·3 mm, wing length 6·5–7·4 mm [9 specimens].

♀. Unknown.

Material examined. Holotype ♂, Kenya: Lumbwa District, Kericho, 2000 m [6500 ft], 21.i.1913 (*C. M. Dobbs*), in British Museum (Natural History), London.

Paratypes. 5 ♂, same data as holotype (4 in BMNH, 1 in AMNH).

5 ♂, same data as type-series (BMNH).

Notes. Curran described this species from eight males with identical data, six of which have been seen. Other specimens with identical data are in BMNH collection that were seen by Villeneuve, and that he intended to describe, hence Villeneuve's (1932) statement of '*Styloneuria maculosa* Villen. in litt.' One of these is labelled 'Styloneuria maculosa Typ. Villen.', another is labelled 'Styloneuria maculosa n. sp.', and a third is labelled '(Britea Curran) Styloneuria tachinoides Curr.', all three labels in Villeneuve's hand. Every specimen seen has the words 'Caught on wall of house' on its data label in addition to the basic data cited above. Villeneuve's name is nomenclaturally unavailable, since although published it was cited as a synonym of *tachinoides*.

Phyto paratachinoides sp. n.

Description. ♂. Extremely similar to *P. tachinoides* described above but differing as follows: head ground colour entirely black, the subparafacial areas and interfrontal area velvety black and not paler than other parts of the head. Eyes even more strongly approximated, frons at narrowest point much narrower than third antennal segment (0·055 of head-width and about twice as wide as anterior ocellus), parafrontals contiguous for a considerable distance. Parafacials slightly narrower, at mid point a little less wide than antenna, totally bare. Arista long-plumose, hairs equally long on upper and lower surfaces and longest hairs much longer than width of frons at its narrowest point. Scutum pollinose only on about the posterior third. Wing with cell R_5 just closed at wing edge, vein *M* with bend slightly rounded rather than abrupt and nearer to wing edge than to *m–cu*. Abdomen with blackish brown ground colour extended forwards mid dorsally on T3 and T4 to form elongate triangles that just reach the anterior margin of the tergite; abdominal pollinosity mainly very pale greyish yellow, but darker yellowish brown close to the dark areas of the tergites; dorsal hairing of intermediate tergites long, fine and erect; apical half of T5 rather reddish. [Genitalia not examined.] Measurements: body length 6·6 mm, wing length 6·1 mm [1 specimen].

♀. Unknown.

Material examined. Holotype ♂, Uganda: Bwamba valley, vii.1945 (*van Someren*), in British Museum (Natural History), London. (Holotype lacking left fore leg from the trochanter.)

Affinities. This species is so close to *P. tachinoides* that the holotype (only specimen yet known) was found standing in the BMNH collection with the material of *tachinoides*. Nevertheless *P. paratachinoides* is certainly distinct, and can easily be differentiated from *tachinoides* at a glance by the strikingly plumose arista. Other distinctions will be clear from the foregoing key and description.

Phyto parafacialis sp. n.

Description. ♂. Ground colour of head blackish, except subparafacial areas dark reddish brown, head pollinosity silvery white; antennae black, palpi brownish. Head higher than broad, eye broadly suboval and slightly oblique, upper occiput flat. Eyes very strongly approximated, frons at narrowest point about equal in width to third antennal segment (0·08 of head-width), but interfrontal area not obliterated and distinctly visible on its whole height (parafrontals not meeting and reduced at narrowest point of frons to exceedingly narrow strips). Outer vertical setae, prevertical setae and proclinate orbital setae absent. Ocellar setae very long and strong, proclinate. Parafacials very narrow, at mid point not more than half as wide as antenna, the lower part only just visible in profile, with a very few small hairs on the upper half. Antennae medium-length, nearly reaching epistome, third segment about twice as long as second; arista long-pubescent (hairs on sub-basal part of dorsal surface almost short-plumosity). Proboscis very short, not nearly as long as head. Thorax brownish black; dorsum with thick silver-grey pollinosity on humeral calli and notopleura, and on a pair of vittae on the anterior part of the prescutum (the silvery paired prescutal vittae very conspicuous and positioned between the presutural *dc* and *acr* setae); pleural regions with thin greyish pollinosity. Two humeral setae. One pair of differentiated presutural *acr* setae. Two strong *post ia* setae, anterior one conspicuously closer to transverse suture than to posterior one. Two *stpl* setae. Pteropleural seta long and moderately strong. Barette with a single fine hair anteriorly [present both sides on the holotype, the only specimen available]. Infrasquamal hairs few, short and inconspicuous. Mesonotal hairing short, sparse and semi-recumbent. Scutellum with a pair of short weak basal setae and with lateral setae equidistant between scutellar base and apical setae. Legs black; claws very long. Fore tibia without submedian *pd* setae, with long fine *pd* preapical seta. Mid tibia with one *ad* seta. Hind tibia with two *ad* setae and two *av* setae. Wings almost hyaline (appearing *very* faintly brownish to naked eye); basicosta dirty yellowish; halteres yellow. Wing cell R_5 closed at wing edge and just basad of extreme wing tip; bend of *M* evenly curved and much closer to wing edge than to *m–cu*; *m–cu* about mid way between *r–m* and the bend, bent inwards medially but not obviously oblique in relation to *M*; basal node of R_{4+5} with one very long setula; costal spine very strong, rather more than twice as long as *r–m*. Calyptrae white, lower calypter faintly discoloured yellowish on outer part. Abdomen brownish black with fasciae of silvery grey pollinosity basally on T3, T4 and T5, the fasciae narrowly interrupted medially where the dark ground colour reaches the anterior margins of the tergites, the pale pollinosity occupying about the basal half of each tergite on the flanks. Abdominal T1+2 without median marginal setae, T3 with strong erect median marginals; T3–T5 each with a pair of erect median discal setae (those on T3 rather small); dorsal hairing of intermediate tergites very sparse, recumbent or semi-recumbent. T7+8 forming a rather prominent knob in situ, epandrium extremely large, both with long setae. Cerci and surstyli long and narrow [ejaculatory sclerite not examined]. Measurements: body length 4·6 mm, wing length 4·0 mm [1 specimen].

♀. Unknown.

MATERIAL EXAMINED. Holotype ♂, SOUTH AFRICA: Natal, Durban, vii.1948 (*J. C. Faure*), in British Museum (Natural History), London. (Holotype lacking left mid and hind legs.)

AFFINITIES. Uncertain, and perhaps more closely with *Rhinomorinia* than with *Phyto* species. The appearance of the abdomen, and especially the very large epandrium and rather humped T7+8, are extremely like those of some South African species of *Rhinomorinia* such as *R. atra*, and I may be mistaken in placing *P. parafacialis* in *Phyto*. I do so, however, mainly on the grounds of *parafacialis* possessing a very large pre-alar seta like that of *Phyto* instead of the very small or non-existent pre-alar seta found in *Rhinomorinia*. Whether this character is as significant in Rhinophoridae as it seems is problematical. A notable feature of the new species, to which the specific name refers, is the very narrow parafacials; the lower parts of these are only just visible with the head seen in profile (a notable difference from other species of *Phyto* and from *Rhinomorinia* species).

Phyto stuckenbergi sp. n.

DESCRIPTION. ♀. Head ground colour black on posterior surface, vertex, parafrontals, parafacials and genal dilations, and yellow-orange to dark orange-red on interfrontal area, subparafacial areas and subocular strips; dark areas with pale yellowish grey pollinosity (not conspicuous); antennae dark brown except for some reddish or orange colouring apically on second segment and at extreme base of third; palpi blackish brown. Head shape generally similar to *P. longirostris* (Fig. 11) but epistome more prominent, eye subcircular, upper occiput distinctly swollen. Frons broad (about 0·37 of head-width), interfrontal area about twice as wide as a parafrontal. Outer vertical setae and prevertical setae present; proclinate orbital setae absent or represented by one or two small inconspicuous proclinate setulae on each side. Ocellar setae very strong, proclinate. Parafacials very broad, much wider than antenna, covered with short rather stiff hairs. Antennae of medium size, nearly reaching epistome, third segment slightly under twice as long as second segment; arista bare. Proboscis elongated but not strongly so, subequal in length to height of the head; palpi small, about as long as third antennal segment. Thorax black with rather even and thin greyish white pollinosity, virtually no pattern but trace of narrow black median paired lines on prescutum in some lights, the pollinosity inconspicuous. Two humeral setae. Two pairs of presutural *acr* setae (anterior one very weak). Two strong *post ia* setae (anterior one slightly closer to transverse suture than to posterior one). Two *stpl* setae. Pteropleural seta absent. Barette bare. Infrasquamal hairs few and minute, very inconspicuous. Scutellum without basal setae but with the lateral setae placed unusually high and very much closer to scutellar base than to apical setae. Legs black. Fore tibia without submedian *pd* setae, with a *pd* preapical seta. Mid tibia with one *ad* seta. Hind tibia with two *ad* setae and one *av* seta. Wings almost hyaline, appearing very faintly smoky to naked eye (especially apically); basicosta pale yellow; halteres pale reddish yellow. Wing venation as Fig. 24; basal node of R_{4+5} bare; costal spine absent. Calyptrae uniformly glassy white. Abdomen uniformly black and rather shining, with a coating of very inconspicuous thin greyish pollinosity (most evident laterally and ventrally). Abdominal T1+2 and T3 without median marginal setae, and tergites without strong discal setae, but sublateral parts of tergite hind margins and discs with some haphazardly developed short fine erect setae. Measurements: body length 5·2–5·8 mm, wing length 4·2–4·6 mm [2 specimens].

♂. Unknown.

MATERIAL EXAMINED. Holotype ♀, SOUTH AFRICA: Cape Province, Bredasdorp District, Arniston coastal dunes, 22–23.x.1964 (*B. & P. Stuckenberg*), in Natal Museum, Pietermaritzburg.

Paratype. 1 ♀, same data as holotype (BMNH).

AFFINITIES. See discussion under following species.

Phyto longirostris sp. n.

DESCRIPTION. ♀. Extremely similar to *P. stuckenbergi* described above but differing as follows: head shape as Fig. 11, epistome more weakly warped forwards from the face and vibrissal angles not very prominent. Frons broader (about 0·43 of head-width), interfrontal area exceptionally large and about 2·6 times as wide as a parafrontal. Antennae heavier, third segment slightly longer in proportion to second. Proboscis very long and slender, its length greatly exceeding height of the head (Fig. 11). One pair of presutural *acr* setae (very strong). Apical scutellar setae directed straight upwards [this feature appears natural but only one specimen available]. Leg setae weaker, *pv* seta minute on one fore tibia and absent on the other in specimen seen. Wing with *m–cu* closer to bend than to *r–m* [extreme apices of holotype wings missing, petiolation if any of cell R_5 not known]. Measurements: body length 5·1 mm, wing length [estimated as wing tip missing] 4·5 mm [1 specimen].

♂. Unknown.

MATERIAL EXAMINED. Holotype ♀, SOUTH AFRICA: Cape Province, Cape Town, Table Mountain slopes above cable house, 24.ix.1959 (*B. & P. Stuckenberg*), in Natal Museum, Pietermaritzburg.

AFFINITIES. This species and *P. stuckenbergi* described above are exceedingly closely related to each other, but the relationships of both the species with other rhinophorids are very uncertain and even their assignment to the genus *Phyto* is only very doubtfully justified. They might better be placed in a new genus of their own when it becomes possible to integrate male characters and early stages into the classification. For the crude alphataxonomic purpose of getting the species described here, however, it seems best to consider the affinities as perhaps lying with *Phyto* species rather than with any other genus, and most of the characters (including the strong pre-alar seta) are those of *Phyto*. Both *stuckenbergi* and *longirostris* differ from other *Phyto* species rather obviously, however, in the head form, the profrontal region being rather strongly produced, the upper occiput rather distinctly swollen and the eyes somewhat subcircular. The elongation of the proboscis is unusual, and *P. longirostris* has a very much more attenuate proboscis than any other described rhinophorid (Fig. 11), although elongation approaching the same extent occurs in another South African species, namely *Rhinomorinia vittata* (Fig. 9). *P. stuckenbergi* and *P. longirostris* are also rather atypical for rhinophorids in the diminutiveness of the palpi, which do not attain to the length of the third antennal segment.

Genus ***QUEXIMYIA*** **gen. n.**

Type-species: *Queximyia flavipes* sp. n.

DIAGNOSIS. Head profile as Fig. 14. Eyes elongate-oval in outline, slightly oblique; gena well developed, its depth much greater than the antennal width. Epistome flat in the plane of the face, facial profile long and almost straight. Vibrissal angle sharp but not protruding, slightly less prominent than the profrons, vibrissae inserted well below the level of the lowermost point of the eye. Eyes of ♂ not approximated, frons equibroad in both sexes. ♂ without proclinate orbital setae [? constant], both sexes with prevertical setae and without outer vertical setae. Parafacials slightly narrower than antennae, well visible in profile, totally bare. Antennae long, antennal axis above level of eye middle, antennal apices reaching the epistome; arista long-pubescent. Proboscis very short. Pre-alar seta strong, much larger than notopleural setae. Presutural *acr* setae absent. Lower prostigmatic seta weak, hair-like, not proclinate. Pteropleural seta well developed. Barette bare. Apical scutellar setae strong, almost as large as lateral setae and crossing in proximal half. Mid tibia with one *ad* seta. Hind tibia with two *ad* setae, two *av* setae, a strong *pv* apical seta. Wing venation as Fig. 20: cell R_5 just closed at the wing apex; bend of vein *M* very widely obtuse and gently and evenly rounded; *m–cu* slightly bent but its general direction at right-angles to veins *M* and Cu_1; basal node of R_{4+5} setulose; costal spine differentiated (slightly longer than *r–m*). Abdomen with median discal setae on T3–T5; T1+2 without median marginal setae. ♂ genitalia with long narrow cerci and surstyli [distiphallus and ejaculatory sclerite not examined].

DISTRIBUTION. Known only from South Africa.

DISCUSSION. This genus is proposed for a previously undescribed South African species that differs from all other Afrotropical rhinophorids, and virtually all Eurasian forms also, in having exceptionally elongate antennae and some unusual and associated characteristics in the head shape. The profile of the lower margin of the head is unusually straight (Fig. 14) and the vibrissae are inserted about at the lowermost point of the head, whereas in almost all other rhinophorids the ventral profile of the head is curved or angulate and the vibrissae inserted well above the lowermost point of the head (cf., for example, Figs 8–12, 15–17). But so far as can be judged at present the closest relationship of *Queximyia* is most probably with *Phyto*, with which there is a general agreement in many of the characters, for example the occurrence of a strong pre-alar seta and of median discal abdominal setae (although the new genus differs very obviously from *Phyto* in head structure). Regarding the exceptionally long antennae it may be noted that similarly attenuate antennae reaching to the vibrissae occur in the Oriental genus *Acompomintho*, but this genus has a very long-petiolate wing cell R_5, setose parafacials and reduced palpi, and lacks the pre-alar seta, and close affinity between *Queximyia* and *Acompomintho* is unlikely.

An unusual feature of *Queximyia* is that its included species is extensively reddish yellow on the thorax, abdomen and legs, unlike other rhinophorids in continental Africa and the great majority of rhinophorids in general in which body and legs are black.

Queximyia flavipes sp. n.

DESCRIPTION. ♂. Head ground colour black on frons, parafacials and occiput and reddish yellow on genae, postbuccae and epistome; antennae and arista blackish brown, except second antennal segment and extreme base of third largely reddish orange; palpi yellow, mentum tawny yellow. Parafacials, lower parts of parafrontals and a large area on the postvertex bright silver pollinose; lower parts of head white pollinose, upper parts of parafrontals semi-shining. Head shape much as in ♀ (Fig. 14) but antennae longer and heavier. Ocellar setae weak and proclinate. Lowermost third of facial ridges weakly haired; vibrissae *very* strong. Genal dilation well developed, with sparse long hairs and without strong peristomal setae. Upper occiput hardly at all swollen, wholly bare behind postocular row. Third antennal segment four times as long as second; arista thickened on basal quarter. Thoracic dorsum (including all of the scutellum) blackish brown except for some reddish colouring on humeral calli and supra-alar regions; pleural regions entirely reddish yellow. Prescutum and scutum with a broad silvery pollinose median vitta between the *dc* rows of setae, the vitta single presuturally but subdivided by a fine median dark brown line postsuturally; humeral calli and notopleura with moderately conspicuous silvery pollinosity, pleural regions with very thin inconspicuous whitish pollinosity. Two *stpl* setae (very strong). Infrasquamal hairs few and fine. Scutellum without differentiated setae in addition to the strong lateral and apical setae. Legs reddish yellow with black tarsi; claws long. Wings very pale brownish; halteres yellow. Wing venation as Fig. 20. Calyptrae pale translucent yellowish. Abdomen reddish yellow laterally on T1+2, T3 and T4, broadly brownish black on the dorsum of these tergites and on more or less the whole of T5 and the visible postabdomen; dorsal dark band slightly narrowed at extreme bases of T3 and T4 and yellow colouring here extending closer to mid-line; T3–T5 each with a narrow band of pure white pollinosity basally, the pollen most conspicuous laterally in some lights, black postabdomen strongly shining. T3 without median marginal setae (as T1+2); abdominal hairing long and recumbent, not dense. T7+8 just visible in situ; epandrium enlarged and rotund, bearing many long fine setae. Lobes of sternite 5 very large, downwardly prominent, reddish orange coloured. Measurements: body length 5·9 mm, wing length 4·6 mm [1 specimen].

♀. Very like ♂ but with more extensive reddish yellow ground colour on sides of the prescutum and scutum and at the base of the third antennal segment, and with some reddish ground colour underlying the median silvery pollinose vitta of the thoracic dorsum. Frons with more strongly differentiated metallic and pollinose areas than in ♂, inner parts of parafrontals shining black and very strongly contrasting with silver pollinose outer parts. Antennae shorter and slimmer than in ♂, third segment about 3·3 times as long as second segment. Interfrontal area dark reddish brown. Wing length 4·8 mm [1 specimen].

MATERIAL EXAMINED. Holotype ♂, SOUTH AFRICA: Natal, Durban, Stella bush, 17.x.1931 (*Miss A. Mackie*), in British Museum (Natural History), London.

Paratype. SOUTH AFRICA: 1 ♀, Natal, Durban, Umbilo, 31.vii.1919 (*A. L. Bevis*) (BMNH).

NOTES. This species is so distinctive that it has been described despite the imperfect condition of the type-material. The holotype has the head capsule cracked, a tear in the right wing and lacks the left fore leg; the paratype has the abdomen gummed to the data label and lacks both hind legs and most of the right wing.

Genus *COMOROMYIA* gen. n.

Type-species: *Comoromyia griseithorax* sp. n.

DIAGNOSIS. Eyes elongate-suboval in outline, very slightly oblique; gena moderately large, its depth greater than the antennal width. Epistome warping slightly forwards from the face, facial profile weakly concave. Vibrissal angles moderately sharp, a little less prominent than the profrons, vibrissae inserted slightly below the lowermost point of the eye but well above lowermost point of the head. Parafacials narrower than antennae but just visible in profile, totally bare. Antennae of medium length and nearly reaching the epistome, antennal axis well below eye middle; arista bare. Proboscis very short. Pre-alar seta strong, much larger than notopleural setae. Presutural *acr* setae present (one very weak pair differentiated). Lower prostigmatic seta hair-like and proclinate. Pteropleural seta hair-like. Barette bare. Apical scutellar setae moderately strong, crossing in apical half, about two-thirds as long as lateral setae (latter placed higher than usual on sides of scutellum). Mid tibia with one *ad* seta. Hind tibia with one *ad* seta, one *av* seta and a very strong *pv* apical seta. Wing venation as Fig. 18: cell R_5 closed and with long petiole subequal in length to *m–cu*; bend of vein *M* strongly angulate, changing direction at about 100°, but actual point at which bend occurs rather rounded; *m–cu* almost straight, at right-angles to *M* but obtuse in relation to last section of Cu_1; basal node of R_{4+5} with one long setula; costal spine undifferentiated. Abdomen without discal setae; T1 + 2 without median marginal setae.

DISTRIBUTION. Known only from Comoro Islands.

DISCUSSION. The foregoing diagnosis is based only on the female sex, the male being unknown. Ordinarily I should hesitate to describe a new genus on one sex only, but in the present case it appears justified as the appearance of the female is very distinctive and there should be no difficulty in correlating the male at a later date. One female of *Comoromyia* is to hand, namely the holotype of the new species *Comoromyia griseithorax* described below. This specimen was collected by Mr Loïc Matile on a recent visit to the Comoro Islands and is the only specimen of Rhinophoridae yet known from any of the Indian Ocean islands.

The new species does not fit satisfactorily in any described genus and in the absence of the male it is hard to assess the possible affinities. The strong pre-alar seta and general facies suggest a relationship with *Phyto*, but the head form and wing venation do not justify squeezing *griseithorax* into this or any other related genus already described. The wing venation and bare parafacials recall the European genus *Paykullia* (syn. *Chaetostevenia*), but total facies and the large pre-alar seta make it inappropriate to assign the new Comoro Island species to this genus.

The total appearance of *C. griseithorax* is rather muscid-like, the uniformly ashy grey thorax and the form and bristling of the head being reminiscent of some Coenosiinae.

Comoromyia griseithorax sp. n.

DESCRIPTION. ♀. Head ground colour blackish on the frons, parafacials and posterior surface (including the genal dilations), brownish on the face and epistome, and reddish orange on the subtriangular area between genal dilations and parafacial; antennae brown except for yellowish orange bases of the third segments; palpi yellow. Parafrontals pale ashy grey pollinose (pale colour strongly contrasting with velvety black interfrontal area), posterior surface of head ashy grey pollinose, facial regions white pollinose. Outer vertical setae absent, prevertical setae directed backwards rather than outwards, two pairs of proclinate orbital setae [holotype, the only specimen, with the lower proclinate orbital seta of one side very weak]. Ocellar setae small and proclinate. Parafrontals very sparsely haired. Vibrissae strong, exactly level with epistome. Genal dilation well developed, anteroventral corner with a rather strong peristomal seta. Third antennal segment 2·5 times as long as second; arista thickened on basal fifth. Thorax with blackish ground colour and uniformly and rather thickly pale ashy grey pollinose. Two *stpl* setae (both very strong). Second *sa* seta absent. Infrasquamal hairs few, minute. Scutellum without differentiated setae in addition to the lateral and apical pairs. Legs mainly reddish yellow, but tarsi blackish, fore femora largely brownish, mid and hind femora indefinitely darkened preapically, coxae partially brownish or blackish under the pollinosity; claws medium-sized. Wings very faintly yellowish brown infuscate, especially near veins; halteres pale creamy yellowish. Wing venation as Fig. 18. Calyptrae translucent medially and faintly yellowish peripherally. Abdomen tawny reddish yellow with indefinite reddish brown darkening medially, T5 more blackish brown, hind margins of tergites very narrowly paler yellow; abdominal dorsum with trace of very thin whitish pollinosity seen at some angles. T3 without median marginal setae (as T1 + 2); abdominal hairing long and recumbent. Measurements: body length 5·6 mm, wing length 5·0 mm [1 specimen].

♂. Unknown.

Material examined. Holotype ♀, Comoro Islands: Anjouan, Col de Moya, 850 m, 16.i.1974 (*L. Matile*), in Muséum National d'Histoire Naturelle, Paris. (The holotype lacks the right hind leg from the trochanter and the right mid leg from the femur, and has a tear in the right wing, but is otherwise complete.)

Genus *STEVENIA* Robineau-Desvoidy

Stevenia Robineau-Desvoidy, 1830 : 220. Type-species: *Stevenia tomentosa* Robineau-Desvoidy, 1830 [=*Tachina atramentaria* Meigen, 1824], by designation of Robineau-Desvoidy (1863 (2) : 378).

Eophyto Townsend, 1919*a* : 163. Type-species: *Eophyto ceylanica* Townsend, 1919, by original designation. **Syn. n.**

Other synonyms: several other generic synonyms (see Herting, 1961).

Diagnosis. Head shape varied but profile typically much as Fig. 15. Eyes narrowly to broadly suboval in outline, slightly oblique; gena moderately large, its depth much greater than antennal width. Epistome weakly warped forwards from the face, facial profile very slightly to moderately concave. Vibrissal angles very weak to moderately strong, usually less prominent than the profrons but occasionally about equally so, vibrissae inserted below lowermost point of the eye but well above lowermost point of the head. Eyes of ♂ either wide apart and frons equibroad with ♀, or partially approximated so that ♂ frons narrower than ♀ (if ♂ eyes approximated then *not* to the extent that interfrontal area is obliterated or prevertical setae lost). ♂ with or without proclinate orbital setae, ♂ and ♀ with prevertical setae (sometimes two pairs and often reclinate instead of directed outwards), both sexes with or without outer vertical setae. Parafacials of varied width but well visible in profile, haired and with some very strong setae (latter proclinate and usually on lower half of parafacial only). Antennae small or medium-sized, falling short of epistome, antennal axis at or below level of eye middle; arista bare to long-pubescent. Proboscis short, not longer than head. Pre-alar seta very weak or virtually absent, much smaller than notopleural setae. Presutural *acr* setae usually present but occasionally very weak or one of the usual pair missing. Lower prostigmatic seta weak or hair-like, directed outwards or downwards. Pteropleural seta weakly differentiated. Apical scutellar setae strong and almost as large as lateral setae, usually crossing near the middle; scutellum most often with a pair of small basal setae in addition. Mid tibia with two or more *ad* setae. Hind tibia with two or more *ad* setae, two or three *av* setae, and with a strong *pv* apical seta. Wing venation as or similar to Fig. 26: cell R_5 closed well before wing margin and long-petiolate, the petiole about as long as or longer than *m–cu* (except for *S. acutangula* Villeneuve in which less than half as long as *m–cu*); bend of vein *M* very abrupt, direction changing at about 90–115° (except in *acutangula* in which widely obtuse); *m–cu* straight or weakly sinuous, at right-angles to or slightly oblique in relation to *M*; basal node of R_{4+5} setulose; costal spine strong. Abdomen with or without discal setae; abdominal T1+2 with or without median marginal setae. ♂ genitalia with elongate narrow cerci and surstyli (latter longer than former in species examined); ejaculatory sclerite small and subspatulate at each end or rather large and fan-shaped.

Distribution. Palaearctic Region, Socotra and Sri Lanka (Ceylon). Best represented through the Mediterranean subregion (including North Africa) to the Middle East and southern U.S.S.R. but occurring in Europe northwards to southern England and southern Scandinavia. Unknown from Canary Islands and Madeira.

Hosts and early stages. *Stevenia atramentaria* reported as a parasite of the woodlouse *Porcellio scaber* L. by Thompson (1934, as 'Species B' unnamed with 'B' now determined by Bedding (1973 : 28) to be *atramentaria*). This species also listed as a parasite on woodlice of the genera *Philoscia* Latreille and *Tracheoniscus* Verhoeff by Herting (1961 : 3) and the genus *Stevenia* listed as parasitizing *Oniscus* L. woodlice by van Emden (1954 : 10), but neither author citing supporting references. Early stages of *atramentaria* described by Thompson (1934, as 'Species B') and Bedding (1973).

Discussion. This is one of the largest rhinophorid genera, being about equal in number of species to *Phyto* and including thirteen species in Herting's (1961) treatment. Up to now the genus has been known only from the Palaearctic Region, but a species occurs in the island of Socotra in the Afrotropical Region and another in Sri Lanka (Ceylon). The Socotran species is newly described below on the basis of some specimens that have stood unnamed for many years in the BMNH collection and that certainly represent a new species distinct from any of those known in the

Palaearctic Region (Dr Herting has kindly confirmed my opinion that the species has not previously been described).

The species from Sri Lanka is known only from one specimen, the female holotype of *Eophyto ceylanica* Townsend and the nomenclatural basis of Townsend's (1919*a*) monotypic genus *Eophyto*. This specimen, from the United States National Museum, has been examined and found to be generically indistinguishable from *Stevenia*, although specifically it is certainly the basis of a valid name. *Stevenia* is the most distinctive genus of Rhinophoridae, being easily recognized by the strong setae on the parafacials in combination with the long-petiolate wing cell R_5, together with a number of other features such as 2(+) *ad* setae on the mid tibia, 2(+) *av* setae on the hind tibia, and a small pre-alar seta, and *Eophyto* has all of these *Stevenia* characters. I therefore see no justification for maintaining *Eophyto* as a valid genus and here sink the name into new synonymy with *Stevenia*. The *ceylanica* holotype has the hind cross-vein *m–cu* less oblique than is typical and nearer than normal to cross-vein *r–m*, and has the parafacial setae forming a row down most of the parafacial (rather than confined to the lower half), but these features seem to me to be of specific value only, and too insignificant to use to separate *Eophyto* from *Stevenia*. Indeed, the whole facies of *ceylanica* is essentially that of *Stevenia*: the male of *ceylanica* being unknown, however, it has to be presumed that the male genitalia of this species will conform in general structure to those of *Stevenia* in general.

Here it may be noted that I have examined the male genitalia of *Stevenia socotrensis*, *S. atramentaria* and *S. umbratica* (Fallén) and all have very similar long forwardly curving surstyli and much shorter pointed cerci. The ejaculatory sclerite is more variable, and in *atramentaria* is a rather large and conspicuous fan-shaped structure that is rather pale and weakly sclerotized.

S. atramentaria is here considered to be the type-species of *Stevenia*, in accordance with Herting's (1974 : 33) revised opinion that the nominal type-species (*S. tomentosa*) is synonymous with *atramentaria* and not with *S. umbratica* as had been accepted in the past – for example, by Townsend (1938 : 204) and by Herting (1961 : 21) himself.

The new species of *Stevenia* from Socotra is described below.

Stevenia socotrensis sp. n.

DESCRIPTION. ♂. Head blackish with thin inconspicuous whitish pollinosity, the parafrontals rather shining; area between genae and parafacials, and sometimes the interfrontal area more reddish than elsewhere; antennae mainly dark brown, but reddish orange apically on the second segment and basally on the third; palpi dark brown. Head shape as Fig. 15. Eyes hardly at all approximated, but frons slightly narrower than in ♀; interfrontal area subequal in width to a parafrontal. Outer vertical setae absent, one or two pairs of strong prevertical setae (directed slightly outwards), one pair of strong proclinate orbital setae (haphazardly accompanied by a weak second proclinate orbital seta on one side or both). Ocellar setae almost hair-like. Parafacial setae with about four main setae in the series. Upper occiput weakly swollen, with sparse black setulae. Genae with very long strong hairing. Third antennal segment about 1·2 times as long as second; arista thickened on about basal quarter, almost bare. Thorax black, very thinly whitish pollinose, dorsum virtually without vittae and pleural regions shining. Two pairs of presutural *acr* setae. Two or three *stpl* setae (lower anterior one not always differentiated). Second *sa* seta absent or represented by a hair. Infrasquamal hairs absent or very sparse. Scutellum with lateral setae standing closer to scutellar base than to apical setae, and without trace of basal setae. Legs black; claws of moderate length, about as long as last tarsal segment. Femora and tibiae without modified hairing or spinules; fore tibia with a strong submedian *pd* seta and with *pd* preapical seta; mid tibia with two *ad* setae; hind tibia with two *ad* setae. Wings pale brownish, colouring most intense anteriorly and very faint posteriorly; basicosta reddish yellow; halteres pale brownish. Wing venation as Fig. 26: base of R_{4+5} with long fine setulae in a series extending from the node for about three-quarters of the distance to *r–m*; costal spine moderately strong, slightly longer than *r–m*. Calyptrae whitish or very pale dingy brownish. Abdomen black with fasciae of greyish white pollinosity on about basal third or two-fifths of tergites 3, 4 and 5. Abdominal T1 + 2 and T3 each with a pair of strong erect median marginal setae; T3 with one pair of median discal setae, T4 with one or more pairs of median discals, and T5 with a transverse row of discal setae. Postabdomen with T6 very small and rather weakly sclerotized, T7 + 8 and epandrium without strong setae (only with long hairing). ♂ genitalia with surstyli long, attenuate and rather strongly curved forwards seen in profile; cerci elongate but much shorter than surstyli, pointed in profile and bluntly rounded in apical view; ejaculatory sclerite medium-sized, broad and widening at each end. Measurements: body length 4·9–5·0 mm, wing length 4·1 mm [2 specimens].

♀. Similar to ♂ but frons slightly wider and abdomen entirely shining (without evident bands of pollinosity on T3–T5); discal setae of T3 and T4 much weaker than in ♂, and tarsal claws shorter. Measurements: body length 3·8–4·1 mm, wing length 3·1–3·5 mm [2 specimens].

Material examined. Holotype ♂, Socotra: Adho, Diemellus, 1100 m [3500 ft], 15.ii.1899 (*W. R. O. Grant*), in British Museum (Natural History), London.

Paratypes. 2 ♂, 2 ♀, data and depository as for holotype.

Affinities. *Stevenia socotrensis* has a combination of characters cutting across those of other species, and it is difficult to suggest particular affinity with a Palaearctic form. If run in Herting's (1961) key to species *socotrensis* will not pass the second couplet because it shows the presence in combination of median marginal setae on T1 + 2, presutural *acr* setae and two *or* three *stpl* setae. On balance it appears fairly close to the type-species, *S. atramentaria*, and the genitalia are closely similar to those of this species; but it differs considerably from *atramentaria* in general appearance, less extensive bristling (only two *ad* setae on the hind tibia, for example), presence of proclinate orbital setae in the ♂, wider ♂ frons, and in the extent of setulae along the basal part of vein R_{4+5}. The last-mentioned character recalls *S. umbratica*, in which setulae extend at least halfway to *r–m*, and the head shape of *socotrensis* (with presence of proclinate orbital setae in both sexes) is also *umbratica*-like, but *socotrensis* has abdominal discal setae (absent in *umbratica*), fewer leg setae and no spiniform vestiture at the apex of the *pv* surface of the ♂ mid femur. *S. socotrensis* differs from both *umbratica* and *atramentaria* in having the lateral scutellar setae conspicuously nearer to the base of the scutellum than to the apical setae.

Genus *MELANOPHORA* Meigen

Melanophora Meigen, 1803 : 279. Type-species: *Musca grossificationis* Linnaeus, 1758 [= *Musca roralis* Linnaeus, 1758], by monotypy.

Illigeria Robineau-Desvoidy, 1830 : 273. Type-species: *Illigeria atra* Robineau-Desvoidy, 1830 [= *Musca roralis* Linnaeus, 1758], by designation of Townsend (1916 : 7).

Diagnosis. Head profile as Fig. 17. Eyes broadly ovate, slightly oblique; gena very large, its depth several times greater than antennal width and more than half eye height. Epistome slightly warped forwards from the face, facial profile weakly concave. Vibrissal angles poorly defined and much less prominent than profrons, vibrissae inserted far below lowermost point of the eye. Eyes of ♂ not approximated, frons equibroad in both sexes. ♂ and ♀ with proclinate orbital setae, prevertical setae and outer vertical setae. Parafacials wider than antennae and well visible in profile, bare or with some fine hair on upper parts. Antennae extremely small and falling short of the epistome, antennal axis far below eye middle (scarcely above lowermost point of the eye); arista micropubescent or long-pubescent. Proboscis very short. Pre-alar seta absent. Presutural *acr* setae absent. Lower prostigmatic seta moderately strong, proclinate or slightly so. Pteropleural seta weak or undifferentiated. Barette bare. Apical scutellar setae very weak, about half as long as lateral setae or less, usually crossing near their apices. Mid tibia with one *ad* seta (very small). Hind tibia with one or two *ad* setae (very small), with one *av* seta and with small *pv* apical seta. Wing venation as Fig. 25: cell R_5 closed far from wing margin and with very long petiole; bend of vein *M* not widely obtuse (about 110–115°), usually abruptly angulate but sometimes rounded (especially in ♀); *m–cu* nearly straight and about at right-angles to veins *M* and Cu_1; basal node of R_{4+5} setulose; costal spine undifferentiated. Abdomen without discal setae; T1 + 2 with median marginal setae. ♂ genitalia with pointed narrow cerci and broadly rounded surstyli of subequal length, ejaculatory sclerite strongly spatulate.

Distribution. Western Palaearctic Region, including the British Isles and North Africa. Occurring also in the eastern United States, Jamaica and Brazil, but possibly as a recent immigrant from Europe. Present in Cape Verde Islands but apparently unrecorded from Canary Islands and Madeira.

Hosts and early stages. The one known species parasitic on woodlice of the genus *Porcellio* Latreille in Europe (Thompson, 1934) and North America (Brues, 1903), and of the genus

Armadillidium Brandt & Ratzeburg in Brazil (Parker, 1953). Early stages described by Bedding (1973), Parker (1953) and Thompson (1934).

DISCUSSION. This genus is monotypic, including only *M. roralis*, and finds a place in the coverage of the present work only because this species occurs in the Cape Verde Islands. Specimens of *roralis* from the Cape Verde Islands are present in the BMNH collection, and Herting (1958) has already recorded the species from this locality.

Melanophora roralis (Linnaeus)

Musca roralis Linnaeus, 1758 : 597. Holotype ♀, EUROPE (Linnean Society, London) [examined].
Musca grossificationis Linnaeus, 1758 : 599. Holotype ♀, EUROPE (Linnean Society, London) [examined].
Musca interventum Harris, 1780 [not 1776] : 144 (pl. 42, fig. 57). Type(s), GREAT BRITAIN: England (lost).
Tachina interlapsa Walker, 1853 : 37. Type(s), GREAT BRITAIN: England (lost).
Other synonyms: numerous other synonyms, see Guimarães (1971) and Herting (1974; 1976).

DESCRIPTION. ♂. Head, antennae and palpi brownish black. Head shape as Fig. 17 and in detail as illustrated by Thompson (1934 : fig. II, 2). Frons with about six pairs of strong proclinate orbital setae. Ocellar setae moderately developed, proclinate. Upper occiput not swollen, bare behind the postocular row. Third antennal segment *very* small and rounded, equal in length to second. Thorax black and semi-shining, without evident pollinosity. Three *stpl* setae, but anteroventral one sometimes hair-like. Infrasquamal hairs absent or very few and minute. Legs black; claws very small, much shorter than last tarsal segment. Wings brown, the infuscation weakening slightly and evenly towards the hind margin; halteres black. Wing venation as Fig. 25. Calyptrae pale brownish. Abdomen entirely shining black, without pollinosity; abdominal hairing short, dense and recumbent. Measurements: body length 4·0–7·1 mm, wing length 3·3–5·5 mm.

♀. Very like ♂ but differing by having much shorter hairing on the arista, the apex of the wing abruptly milky white behind the petiole (as figured by Thompson (1934 : 385)), and the abdomen strongly pointed. Size range about as for ♂.

MATERIAL EXAMINED. Holotype ♀ of *roralis*, EUROPE (no other data), in Linnean Society, London. Holotype ♀ of *grossificationis*, EUROPE (no other data), in Linnean Society, London. (*roralis* holotype in fair condition except for loss of left mid leg and apices of some tarsi; *grossificationis* holotype pressed flat on paper mount bearing ink number '1051' correlating with Linnaeus's published 'Fn. Suec.' number, legs lost except one fore leg.)

CAPE VERDE ISLANDS: 3 ♂, St Vincent, 13.iv.1896 (*O. Thomas*) (BMNH). 121 ♂ & ♀, various localities in GREAT BRITAIN: England, EUROPE, ALGERIA, NORTH AMERICA, JAMAICA and BRAZIL (BMNH).

DISTRIBUTION. The material seen reflects the distribution of *Melanophora roralis*, the species occurring throughout Europe and in Palaearctic Africa, and in some eastern parts of the New World. The species is known from three islands of the Cape Verde group, the BMNH material confirming its presence in São Vicente, and Herting's (1958) record confirming its presence in Santo Antão and Brava (material from Herting's record in Zoological Museum, Helsinki).

Genus *PARAZAMIMUS* Verbeke

Parazamimus Verbeke, 1962 : 164. Type-species: *Parazamimus congolensis* Verbeke, 1962, by original designation.

DIAGNOSIS. Head profile as Fig. 30. Eyes broadly rounded, slightly oblique; gena extremely large, its depth greater than *length* of third antennal segment and more than half eye-height. Epistome very slightly warped forwards, facial profile very weakly concave. Vibrissal angles poorly defined but about equal in prominence to profrons, vibrissae inserted below lowermost point of the eye. Eyes of ♂ not approximated. ♂ with proclinate orbital setae, prevertical setae and outer vertical setae. Parafacials narrower than antennae, narrowly visible in profile and finely haired. Antennae minute and not nearly reaching epistome, antennal axis just below eye middle; arista thickened only at extreme base, exceedingly fine and bare. Proboscis very short, in rather small oral cavity. Pre-alar seta absent. Presutural *acr* setae absent. Lower prostigmatic seta absent. Pteropleural seta undifferentiated. Barette bare or with a very few hairs. Apical scutellar setae strong and convergent, equal in size to lateral setae, laterals inserted much closer to scutellar base than to apical setae. Mid tibia with one *ad* seta. Hind tibia with two *ad* setae, two *av* setae and a *pv* apical seta. Wing venation as Fig. 29: cell R_5 just closed at wing apex; bend of vein *M* very widely obtuse and gently rounded; *m–cu* nearly straight and about at right-angles to vein *M*; basal node of R_{4+5} with one fine setula; costal spine undifferentiated. Abdomen without discal setae; T1+2 without median marginal setae. ♂ genitalia with short cerci and surstyli of subequal length, ejaculatory sclerite large and fan-shaped.

DISTRIBUTION. Known only from Zaire.

DISCUSSION. This genus is still known only from the male holotype of *P. congolensis*, and the foregoing diagnosis might need adjustment when the female becomes known; it is likely, however, that the female will be closely similar to the male. The relationships of *Parazamimus* are obscure, and it is not certain that it is correctly placed in Rhinophoridae, as Verbeke stated in the description ('Affinités incertaines; appartient probablement aux Rhinophoridae'), but the genus fits quite well to the definition of Rhinophoridae given in this paper on all its external features and I accept *Parazamimus* as a rhinophorid for present purposes. The distiphallus of the aedeagus, however, is extremely similar to that of many Calliphoridae and if not a rhinophorid then *Parazamimus* must certainly belong in the Calliphoridae (the slide-mounts of the ♂ genitalia of *congolensis* made by Verbeke have been examined and the distiphallus found to be extremely accurately figured by Verbeke, pl. 12, fig. 9). Verbeke compared *Parazamimus* to '*Reichardia*', but this was due to a complete misunderstanding of *Reichardia* Karsch which is a tachinid genus in the Voriini, and '*Reichardia insignis* Karsch' sense of Verbeke is actually *Bequaertiana* (see next genus). Some interesting resemblances exist between *Bequaertiana* and *Parazamimus* and these are discussed in more detail under the treatment of the former.

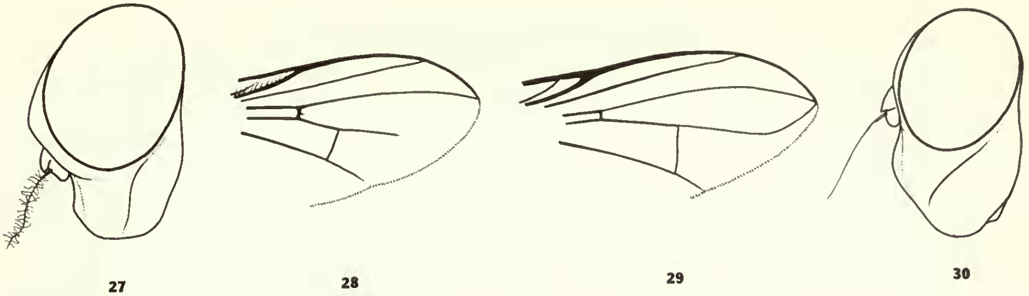
Parazamimus congolensis Verbeke

Parazamimus congolensis Verbeke, 1962 : 164. Holotype ♂, ZAIRE (IRSNB, Brussels) [examined].

DESCRIPTION. ♂. Head ground colour reddish; antennae reddish orange; palpi reddish yellow. Head shape as Fig. 30. Frons very wide, about 0·38 of head-width. Two pairs of strong proclinate orbital setae. One pair of strong prevertical setae. Vibrissae strong and crossed, facial ridges above vibrissae rather strongly swollen and with long hair. Upper occiput apparently mainly bare behind postocular row. Antennae with second segment conspicuously large and third segment extremely small and orbicular (shorter than second segment). Thorax entirely reddish yellow. Two humeral setae [but inner one a minute hair on one side in holotype]. Posterior notopleural seta much weaker than anterior one. 0+1(2) *acr* setae. 2+3 *dc* setae [holotype with fine setula preceding *prst dc* setae]. 0+2 *ia* setae (the *post ia* setae unusually close to each other and rather remote from transverse suture). Second *sa* seta absent. Prosternum and propleuron bare. Two *stpl* setae. Infrasquamal hairs present, long and fine. Legs reddish yellow (tarsi appearing darker apically because of black hairing); claws very short. Fore coxa bare on inner anterior surface. Fore tibia with two very small *pv* setae. Mid tibia with the *p* and *pd* setae minute (inconspicuous and hardly more than setulae). Hind tibia with two *pd* setae (additional to setae mentioned under genus). Wings long for body size, almost hyaline (very faint trace of yellowish brown colour in some lights); basicosta reddish yellow; halteres yellowish. Bend of vein *M* very close to wing edge; *m–cu* slightly closer to *r–m* than to bend, second costal sector about two-thirds as long as *m–cu*. Wing membrane with exceptionally long microtrichia giving the wings a hairy appearance, costal vestiture entirely hair-like, second and third costal sectors closely haired ventrally. Calyptrae whitish, rather tongue-like with the side margins almost straight and subparallel and the apical part of the margin evenly rounded. Abdomen reddish yellow basally and slightly darkening to reddish posteriorly, without markings. T3–T5 each with full series of marginal setae, but these weak and unusually recumbent on T3; abdominal hairing fine and recumbent. Sternites widely exposed, sternite 5 deeply bifid with evenly rounded lateral lobes. Cerci in apical view broad basally and sharply contracted to narrow apices, surstyli rather broad and with evenly rounded tips (Fig. 37), distiphallus as figured by Verbeke (1962 : pl. 12, fig. 9). Measurements: body length *c.* 7·0 mm, wing length 6·3 mm [1 specimen].

♀. Unknown.

MATERIAL EXAMINED. Holotype ♂ [genitalia slide-mounted], ZAIRE: Kivu, Goma, 16.v.1953 (*J. Verbeke*, KEA), in Institut royal des Sciences naturelles de Belgique. (Holotype not in good condition. Body entirely greased (? with thin pollinose lines on mesonotum), head loose on a micro-pin driven through the thorax and abdomen and emerging mid-dorsally on T4, left fore leg and right mid leg lost, right fore leg gummed to polyporus mount. Verbeke gives length as 6 mm and wing length as 5·5 mm but my measurements by eyepiece micrometer are larger – body without head being exactly 6 mm.)



Figs 27–30 Head profiles in outline, and wings, of (27 & 28) *Bequaertiana argyriventris* and (29 & 30) *Parazamimus congolensis*.

Genus *BEQUAERTIANA* Curran

Bequaertiana Curran, 1929 : 14. Type-species: *Bequaertiana argyriventris* Curran, 1929, by original designation.

[*Reichardia* Karsch sensu Verbeke, 1962 : 130, 164, pl. XII. Misidentification.]

Diagnosis. Head profile as Fig. 27. Eyes subcircular in outline; gena extremely large, its depth much greater than *length* of antennae and more than half eye-height. Epistome gradually warped forwards from deeply excavate face, facial profile slightly concave. Vibrissal angles very blunt and poorly defined, recessive in relation to profrons and approximated to each other so that epistome reduced to unusually narrow strip, vibrissae inserted *far* below lowermost point of eye and not much above lowermost point of head. Eyes of ♂ widely separated. ♂ with proclinate orbital setae, prevertical setae and outer vertical setae. Parafacials about as wide as antennae, well visible in profile and strongly haired. Antennae extremely small and not nearly reaching epistome, antennal axis far below eye middle; arista strongly and irregularly plumose on its length. Proboscis atrophied in extremely small subcircular oral cavity. Prealar seta absent. Presutural *acr* setae absent. Intra-alar setae absent. Lower prostigmatic seta absent or represented by minute hair. Pteropleural seta absent (and pteropleuron totally bare). Barette bare. Scutellum with only one pair of definite marginal setae (divergent or subparallel and standing in subapical position). Tibiae without setae (at most with setae represented by minute setulae, even at tibial apices). Wing venation as Fig. 28: apical section of vein *M* and the bend of *M* missing (i.e. M_1 absent and cell R_5 not closed posteriorly); *m–cu* straight and at right-angles to vein *M*; basal node of R_{4+5} bare or with fine setulae; R_1 strongly haired along its length; subcosta evanescent apically and costal break virtually absent, no costal spine and costal vestiture entirely hair-like. Abdomen entirely without setae (only sparse hairing). Sternites (♂) widely exposed, sternite 5 bifid with simple lobes. ♂ genitalia with cerci fused into a small subquadrate plate, surstyli long but stout and rounded apically.

Distribution. Tropical African forest areas, known from Liberia, Zaire, Uganda and Rwanda.

Discussion. This is one of the most aberrant genera to be found in the calyptrate flies, and Zumpt (1956 : 176) has gone so far as to state unequivocally that 'It certainly does not belong to the Calyptrata, but to an acalyptrate family near the Lonchaeidae'. Unfortunately Zumpt gives no reasons for this view, which is completely counter to that of the few other dipterists who have seen the genus. Curran (1929) and Townsend (1935, 1938) assigned *Bequaertiana* to the Moriniinae and Melanophorini respectively (i.e. to groups now treated as rhinophorids), and Peris (1957) treated it as part of Rhinophorinae. I am not convinced, despite the likeness of the head to *Melanophora*, that *Bequaertiana* is rightly placed in the Rhinophoridae (especially as the fusion of the cerci of the male genitalia does not occur elsewhere in rhinophorids) but am leaving it in this family until its real affinities can be better determined from discovery of the female, the early stages and the host relations (all at present unknown: parasitic biology presumed). If not a rhinophorid, then it should probably be assigned to the Calliphoridae, and it is noteworthy that the fused cerci are reminiscent of a similar genitalic condition occurring in several calliphorids. There is certainly nothing in my opinion to support Zumpt's suggestion that *Bequaertiana* is an acalyptrate, for it shows in combination most of the classic characters of a calyptrate fly (possessing, for instance, a transverse suture or impression on the mesonotum, numerous setae on the frons, well-developed lower calyptrae and very narrow strip of pleural membrane); only the bristle-less tibiae and the lack of a definite subcostal 'break' in the costa are reminiscent of some acalyptrates.

It is very likely that *Bequaertiana* is a highly apomorphic derivative from a *Parazamimus*-like ancestral form, and if it can be convincingly shown that *Parazamimus* is a rhinophorid then almost certainly *Bequaertiana* is too. The widely dichoptic ♂ heads of the two genera are essentially similar, with minute antennae in a deeply excavate face, rounded eyes and deep gena, and with non-prominent vibrissal angles, but in *Bequaertiana* there is an even more reduced oral cavity than in *Parazamimus* (with obviously non-functional vestigial mouthparts) and the epistome has become very restricted by inward approximation towards each other of the vibrissal angles. The wings are superficially different because of the loss of M_1 in *Bequaertiana*, but actually show a very telling resemblance, as in both genera there is almost no break in the costa near the end of *Sc*, the costa lacks the usual spinules and instead has a vestiture composed solely of uniform strong hairing, and the wing membrane has unusually strong microtrichia (giving the wings a rather 'hairy' appearance, especially in *Parazamimus*). The lower calyptrae also show a resemblance: in both they are longer than is usual in rhinophorids with the sides rather straight, but in *Bequaertiana* they are even longer and more tongue-like than is *Parazamimus*.

Apart from these characters *Bequaertiana* differs from *Parazamimus* (and all other rhinophorids) by several striking features, especially the almost total absence of leg setae (the only femoral setae, for example, being one fine submedian *pv* seta on each hind femur, and even this sometimes absent), the absence of *ia* setae, the presence of only a single pair of clearly differentiated scutellar setae (apicals absent), the reduction of abdominal vestiture to a few fine hairs, and the almost complete absence of fringes to the metathoracic spiracle (and also to the mesothoracic spiracle). The last-mentioned character is quite extraordinary for a calyptrate fly and I can recall no other genus in which the thoracic spiracles appear at low magnification to be such simple open holes (lacking protective fringes or opercula).

Bequaertiana males (but probably not the females, as yet unknown) have the abdomen and to a lesser extent the thorax thickly covered with brilliant silvery white pollinosity, a character of very rare occurrence in calyptrate flies. Presumably its functional significance is to flash in shafts of sunlight penetrating the forest environment (as in certain Stratiomyidae, for example, that have similar dense abdominal silver pollinosity).

Only five specimens of *Bequaertiana* are known belonging to two very closely allied and similar species (or ? subspecies), distinguishable by the following key.

Key to species of *Bequaertiana* Curran

1 Wing vein R_{4+5} with very fine widely spaced setulae on much of its length, the setulae more crowded on the node. Third antennal segment with a few long strong black hairs anteriorly (beyond the insertion of the arista). Ground colour of abdominal tergites (best seen beneath the pollinosity when seen from behind) mainly dark brown, but pale yellowish basally and narrowly creamy whitish on tergite hind margins. Mid and hind femora blackish brown (except for narrowly orange apices); mid coxae dark brown. Pleural regions of thorax pale tawny brownish darkening to shining dark brown or blackish brown on sternopleuron and mesopleuron . . . . **B. basilewskyi** Peris (p. 56)

– Wing vein R_{4+5} totally bare. Third antennal segment without long black hairs. Ground colour of abdominal tergites pale orange-yellow on about the basal two-thirds or more and brown on the remainder (almost no trace of cream-coloured hind margins to tergites except very narrowly and inconspicuously towards the sides). Mid and hind femora pale yellow on about basal three-fifths and pale brown on the remainder; all coxae yellowish. Pleural regions of thorax almost entirely pale reddish yellow (with only a trace of yellowish brown darkening medially on mesopleuron). . . . . **B. argyriventris** Curran (p. 55)

Bequaertiana argyriventris Curran

Bequaertiana argyriventris Curran, 1929 : 15; Townsend, 1935 : 251; Townsend, 1938 : 186; Zumpt, 1956 : 176; Peris, 1957 : 136. Holotype ♂, LIBERIA (AMNH, New York) [examined].

DESCRIPTION. ♂. Head ground colour black on interfrontal area, blackish brown on parafrontals and subparafacial areas, reddish on face, upper occiput blackish [parafacials rather yellow and posteroventral parts of head pale reddish in holotype but probably because natural colouring not fully developed]; antennae clear pale orange-yellow. Frons and vertex very broad, narrowest point of frons about 0·41 of head-width, vertex and upper occiput distinctly sunken. Interfrontal area well developed, subequal in width to parafrontal. Head setae rather fine. About 4–6 pairs of irregularly developed proclinate orbital setae. One pair of long outwardly and backwardly directed prevertical setae (accompanied by secondary prevertical hairs). Inner vertical setae subparallel. Frontal setae rather numerous and haphazardly disposed. Ocellar setae undifferentiated. Parafacial hairing black, rather strong, dense and uniform. Vibrissae weak, equal in size to largest pair of peristomal setae, facial ridges with some long black hairs immediately above vibrissae. Upper occiput with irregular black hairs behind postocular row. Lunula large and yellowish, bare, merging to face by a very slight flat carination that separates antennal bases. Antennae extremely small, in rather deeply excavate face, first and second segments apparently fused, second segment produced into a rather sharp prominent antero-apical flange, third segment exceedingly small and sub-orbicular (much smaller than second segment); arista hardly at all thickened at base and with non-elongate basal segments, with moderately long rather uniform plumosity along the whole length, the hairs springing out at all different angles. Mouthparts almost obsolete, in ventral view consisting of a cordate pad-like structure recessed in the oral cavity, a tuft of black hairs present inside the posterior oral margin. Thoracic ground colour almost uniformly pale reddish yellow, only darkened (to yellowish or slightly reddish brown) on sides of scutellum and on mid parts of mesopleura; dorsum of thorax (except scutellum) with uniform covering of thick brilliant silvery yellowish pollinosity (appearance varying with direction of light), pleural regions virtually non-pollinose. Humeral setae 1–2 [one on one side, two the other, in holotype]. Posthumeral setae absent. *Prst acr* setae absent [*post acr* setae uncertain, destroyed by pin in holotype]. Presutural seta strong. Both notopleural setae strong and subequal. 1 + 3 *dc* setae. Supra-alar area with only one seta (strong first *sa*). Intra-alar setae absent. Postalar callus hardly differentiated from scutum but with two very strong setae. Mesonotum almost devoid of normal surface hairing between *prst dc* seta and presutural seta and in whole large area between *post dc* setae and wing base, and bare also between the two median rows of acrostichal hairs and the *dc* position on the prescutum. Sides of thorax almost bare, vestiture consisting of a few hairs and about 2–4 setae (in the row) on the mesopleuron, a few hairs and two setae on sternopleuron, a minute prostigmatic seta and two or three hypopleural setae (propleural seta not even represented by a hair, pteropleuron all bare, infrasquamal hairs absent). Both thoracic spiracles with simple opening lacking marginal fringes or lappets. Legs yellow on coxae, trochanters, fore femora and basal three-fifths of mid and hind femora, darker yellowish brown on remainder; tarsi very slender, last segment very elongate, claws minute. Fore coxae elongate, with some very small sparse fine hairs on much of inner surface, hind coxae elongate. Femora and tibiae almost completely without evident setae: fore and mid femora totally without setae, hind femur with small submedian *pv* setae [one on one femur and two on the other in holotype]; fore tibia showing minute *pv* setula and hind tibia showing about two *ad* and a *pd* setula (but these scarcely larger than the hairing and only evident with high magnification). Wings faintly smoky brownish, membrane with large and conspicuous microtrichia, costa with long fine uniformly hair-like vestiture; venation as Fig. 28, *r–m* rather long (nearly half *m–cu*) [with median spur on each wing of holotype], *M* with almost no trace of angulation at junction of *m–cu*; tip of *Sc* obsolete, costal break almost obsolete; R_1 with long strong hairs closely set along its length; R_{4+5} (including its basal node) bare. Basicosta yellow; [halteres missing on holotype;] calyptrae translucent pale yellowish, lower calypter elongate, rather tapering and tongue-like. Abdominal ground colour dorsally pale orange-yellow on about the basal two-thirds of T1 + 2, T3 and T4, and on basal three-quarters of T5, and brown on remainder of the tergites, hind margins of tergites *very* narrowly and inconspicuously creamy towards the sides (ground colour only noticeable when fly viewed from behind and pale colour more evidently orange medially than at the sides). Entire upper surface of abdomen thickly covered with brilliant silver pollinosity (under surface without pollinosity and all yellow). Abdomen without any setae, vestiture consisting of *very* sparse and very fine recumbent hairs mainly on the apical halves of the tergites. T7 + 8, epandrium, cerci and surstyli yellow; T7 + 8 short and broad, well visible under T5, with two irregular transverse rows of black hairs; epandrium very short and broad; cerci apparently fused basally [genitalia not removed from holotype] but with very slender free parallel apices; surstyli *much* longer than cerci, rather large and prong-like and directed inwards. Sternites fully exposed in ventral abdominal membrane, St 5 with deep median incision and prominent simple rounded lobes. Measurements: body length 6·2 mm, wing length 4·6 mm [1 specimen].

♀. Unknown.

Material examined. Holotype ♂, Liberia: Du River, camp 3 (*J. Bequaert*), in American Museum of Natural History, New York. (The holotype lacks the right fore and mid legs from the trochanters but is otherwise in good condition.)

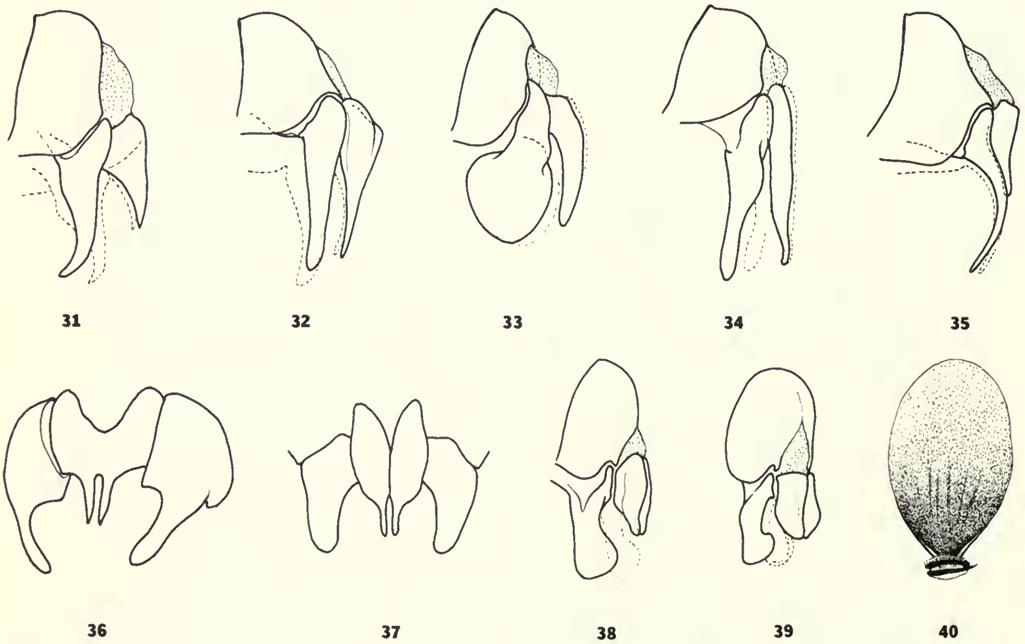
[While this paper was in proof it was seen by Dr Curtis Sabrosky, who kindly informed me of the existence of a second specimen of this very rare species that has not previously been recorded in the literature. Through the courtesy of Dr Sabrosky I have been able to see this specimen (from the U.S. National Museum, Washington, D.C.) and to compare it with the description of *argyriventris* holotype given above. It is a ♂ and undoubtedly conspecific with the holotype but very much smaller (body length 3·7 mm, wing length 3·0 mm), and with more extensively darkened abdominal tergites, one or two more hairs in the mesopleural row, minute ocellar hairs, and the subcostal vein virtually reaching the costa. Cross-vein *r-m* lacks the aberrant median stump that occurs in the holotype. The mid scutum (not visible in holotype because of the pin) shows 2–3 pairs of strong hairs in the mid line but no definite *post acr* setae.

Data of the specimen are: ♂, Liberia: 9.vii.1945 (*M. S. Briscoe*) (USNM). Specimen in good condition except for being slightly teneral and having lost left hind leg from the trochanter.]

Bequaertiana basilewskyi Peris

Bequaertiana basilewskyi Peris, 1957 : 136. Holotype ♂, Rwanda (MRAC, Tervuren) [examined].

Description. ♂. Closely similar to *argyriventris* described above, differing by the following features. Ocellar setae present (very fine and about as long as proclinate orbital setae). Third antennal segment with a few long black hairs on the anterior edge (distad of the aristal insertion). Sides of thorax extensively dark reddish brown to blackish brown on sternopleura and mesopleura and mainly tawny yellowish



Figs 31–40 (31–39) cerci and surstyli of ♂ genitalia in: (31) *Stevenia socotrensis*; (32) *Phyto tachinoides*; (33) *Melanomyoides capensis*; (34) *Rhinomorinia xanthocephala*; (35) *R. sarcophagina*; (36) *Bequaertiana basilewskyi*; (37) *Parazamimus congolensis*; (38) *Oplisa tergestina*; (39) *O. aterrima*. (40) ejaculatory sclerite in the genus *Oplisa* Rondani (drawn from *O. aterrima*). The cerci and surstyli in Figs 31–35, 38 & 39 are drawn slightly off-lateral, those in Fig. 36 slightly off-apical, and those in Fig. 37 are in exact apical view.

brown elsewhere, posterior part of mesonotum and scutellum darkened reddish brown. Postsutural *dc* setae variably developed and very fine, sometimes three but four or five haphazardly occurring in which the anterior ones rather hair-like and only the two posterior ones forming definite setae. Propleural seta represented by a small hair on the propleural angle. Mid coxa largely brown or dark reddish brown (conspicuously darker than fore and hind coxae). Mid and hind femora blackish brown (except for some orange colour at extreme apices). Wing vein R_{4+5} with long very fine and widely spaced setulae on about the proximal two-thirds, the setulae closer together towards the node; vein *M* slightly flexed backwards at junction of *m–cu*. Ground colour of abdomen dark brown dorsally on most of each tergite, tergites narrowly pale yellowish at the base and with conspicuous creamy white hind margins; tergite venters mainly yellowish brown or pale reddish brown, except for pale hind margins.

♀. Unknown.

MATERIAL EXAMINED. Holotype ♂, RWANDA: Ruhengeri, 1900 m, 27.i.1953 (*P. Basilewsky*), in Musée royal de l'Afrique centrale, Tervuren. (Holotype lacks left fore leg and right mid leg from the trochanters, but is otherwise in fair condition.)

UGANDA: 1 ♂, Kalinzu Forest (*T. H. E. Jackson*) (BMNH). ZAIRE: 1 ♂, Tshuapa, Bamania, 5.ix.1953 (*R. P. Hulstaert*) (MRAC: specimen in poor condition, having been at some time dried out from fluid, bearing Verbeke identification label as *B. argyriventris*).

Alphabetical check-list of the Afrotropical fauna

The check-list shows the classification of Afrotropical Rhinophoridae adopted in the foregoing text, but with the valid genera and species arranged alphabetically for convenience. Valid names are in bold type. Synonyms are chronological, in light-face type, and indented in relation to their valid names.

- **RHINOPHORIDAE** Robineau-Desvoidy, 1830
  - ***BEQUAERTIANA*** Curran, 1929
    - ***argyriventris*** Curran, 1929
    - ***basilewskyi*** Peris, 1957
  - ***COMOROMYIA*** **gen. n.**
    - ***griseithorax*** **sp. n.**
  - ***MELANOMYOIDES*** **gen. n.**
    - ***capensis*** (Zumpt, 1959) **comb. n.**
  - ***MELANOPHORA*** Meigen, 1803
    - *Illigeria* Robineau-Desvoidy, 1830
    - ***roralis*** (Linnaeus, 1758)
      - *grossificationis* (Linnaeus, 1758)
      - *interventum* (Harris, 1780)
      - *interlapsa* (Walker, 1853)
  - ***PARAZAMIMUS*** Verbeke, 1962
    - ***congolensis*** Verbeke, 1962
  - ***PHYTO*** Robineau-Desvoidy, 1830
    - *Styloneuria* Brauer & Bergenstamm, 1891
    - *Britea* Curran, 1927 **syn. n.**
    - ***longirostris*** **sp. n.**
    - ***parafacialis*** **sp. n.**
    - ***paratachinoides*** **sp. n.**
    - ***stuckenbergi*** **sp. n.**
    - ***tachinoides*** (Curran, 1927) **comb. n.**
      - *maculosa* (Villeneuve, 1932)
  - ***QUEXIMYIA*** **gen. n.**
    - ***flavipes*** **sp. n.**
  - ***RHINOMORINIA*** Brauer & Bergenstamm, 1889
    - *Oxytachina* Brauer & Bergenstamm, 1891 **syn. n.**
    - *Pseudophania* Brauer & Bergenstamm, 1893 **syn. n.**
    - *Dewetia* Bischof, 1904 **syn. n.**
    - ***approximata*** **sp. n.**
    - ***atra*** (Bischof, 1904) **comb. n.**
    - ***bisetosa*** **sp. n.**
    - ***capensis*** (Brauer & Bergenstamm, 1893) **comb. n.**
    - ***scutellata*** **sp. n.**
    - ***setitibia*** **sp. n.**
    - ***verticalis*** **sp. n.**
    - ***vittata*** (Brauer & Bergenstamm, 1891) **comb. n.**
    - ***xanthocephala*** (Bezzi, 1908) **comb. n.**
      - *novicia* (Villeneuve, 1916) **syn. n.**
  - ***STEVENIA*** Robineau-Desvoidy, 1830
    - *Eophyto* Townsend, 1919 **syn. n.**
    - ***socotrensis*** **sp. n.**
  - ***VENTROPS*** **gen. n.**
    - ***milichioides*** **sp. n.**

Brief review of Oriental Rhinophoridae

On present evidence the rhinophorid fauna of the Oriental Region is extremely meagre, only four species (each in a different genus) being known from the area. The species have been listed earlier by me (Crosskey, in press) in the third volume of *A catalog of the Diptera of the Oriental Region* (Delfinado & Hardy, eds), and that catalogue and the present work provide the only recent information on Oriental forms. The group has been so little collected that the four species are still known only from their type-material. A key for their identification is given below, followed by short notes on each of them.

1 Wing with cell R_5 long-petiolate and the bend of M forming an abrupt right-angle. Parafacials with proclinate setae 2

– Wing with cell R_5 open at the margin and the bend of M forming an evenly rounded and widely obtuse curve. Parafacials with some fine hairing but without setae 3

2 Antennal axis far above eye middle and antennae correspondingly very elongate. Parafacials with weak setae confined to the lower halves. Arista thickened on at least half its length and with second segment conspicuously elongate. Mid tibia with one *ad* seta. Intermediate abdominal tergites without median marginal setae. Fore tibia without *pd* setae. [♂ head with prevertical setae, outer vertical setae and one pair of proclinate orbital setae] **_Acompomintho lobata_** Villeneuve (p. 58)

– Antennal axis level with eye middle and antennae short. Parafacials with very strong setae on most of their height. Arista thickened only at the base and with second segment not elongate. Mid tibia with two *ad* setae. Intermediate abdominal tergites with median marginal setae. Fore tibia with two *pd* setae. [♂ unknown] . . . . **_Stevenia ceylanica_** (Townsend) (p. 59)

3 Legs and most of body pale reddish yellow. Palpi greatly enlarged, flattened and leaf-like, yellow with brownish tips and bearing strong spinous setae. Antennal axis far above eye middle (not much below topmost point of the eye). Wing veins R_1 and R_{4+5} finely setulose on their whole length. Mentum greatly enlarged and boat-shaped, yellow. Hind tibia with unusually large *d* preapical seta that is longer than the first hind tarsal segment and *much* larger than the *ad* and *pd* preapical setae. Mid tibia with two *ad* setae. Proclinate orbital setae absent. Vibrissae not more than half as long as epistomal width and not meeting or crossing **_Termitoloemus marshalli_** Baranov (p. 60)

– Legs and body black. Palpi normal, slender and black. Antennal axis about level with eye middle. Wing veins R_1 and R_{4+5} bare (except for the usual setulae on node). Mentum narrow and parallel-sided, dark brown. Hind tibia with normal *d* preapical seta that is much shorter than first hind tarsal segment and subequal in size to *ad* and *pd* preapical setae. Mid tibia with one *ad* seta. Proclinate orbital setae present (one pair). Vibrissae moderately strong, longer than epistomal width and cruciate . . . **_Rhinomorinia longifacies_** Herting (p. 59)

Acompomintho lobata Villeneuve

Acompomintho lobata Villeneuve, 1927 : 223. Syntypes ♂ ♀, Formosa (DEI & BMNH, probably elsewhere also) [BMNH syntypes examined].

Wagneriopsis formosensis Townsend, 1927 [July] : 281. Syntypes ♂ ♀, Formosa (DEI).

The nominal species *lobata* and *formosensis* are type-species respectively of *Acompomintho* Villeneuve (1927) and *Wagneriopsis* Townsend (1927). The descriptions were published a month apart (Villeneuve's on June 1st and Townsend's on July 1st), and Townsend (1931) established the synonymy of the specific names (thereby effectively establishing synonymy of *Wagneriopsis* and *Acompomintho*). In the 1931 work, and in later works, Townsend consistently mis-spelt Villeneuve's generic name as *Acampomintho*, an error perpetuated by Lopes (1938) and Hennig (1941). *Acompomintho* is the type-genus of Townsend's (1935 : 253) tribe Acompominthoini (proposed as Acampominthoini), a segregate not recognized in the present paper.

Acompomintho lobata is still known only from Formosa. It is easily recognized by the combination of long-petiolate cell R_5, long antennae and thickened arista (in which the second segment is unusually elongate like that of the Madeiran genus *Azaisia* Villeneuve). In addition to Villeneuve's detailed original description there is a German description by Herting (1961) and an extremely full and figured description in Portuguese by Lopes (1938).

The type-status of the original material of *lobata* and *formosensis* is muddled and both nominal species are here considered to be still based upon syntypes, the various citations of 'Holotype' and 'Typus' in the later literature being invalid for the reasons detailed below.

Villeneuve described *lobata* from 'nombreux individus' of both sexes from Tainan, Formosa, and gave the collecting date as 'II. 1909'. That he certainly had a large number of specimens before him at the time of description is clear from Hennig's (1941 : 186) recording '37 Typen' from

'Tainan II' as present in the Deutsches Entomologisches Institut (DEI) collection. Townsend (1931 : 383) referred to 'Male Ht' in 'Berlin-Dahlem' (i.e. holotype in DEI), and in a later work (Townsend, 1938 : 207) referred to 'Ht male – Origin, Tainan, Formosa; location, Berlin DEI' but in neither case does his statement 'Ht' (=holotype) constitute a valid lectotype fixation because there is no means of knowing which of the males from Tainan it was intended should be the primary type. Lopes (1938 : 556) referred to his seeing '4 exemplares typicos machos' without fixing a primary type.

In the case of *formosensis* the original material consisted of one male and six female specimens from Hokuto, Anping, Kankau and Macuyama (without indication of how many specimens of which sex from which locality). Townsend (1931 : 383) later referred to 'female Ht in Berlin-Dahlem, also from Formosa' but this statement does not pin the name *formosensis* to a single recognizable specimen. Townsend (1938 : 207) later referred to 'Ht female . . . from Hokuto . . . in Berlin DEI' and it is possible that this could be accepted as a valid lectotype fixation if only a single female from this locality exists. However, the situation is complicated by the fact that Lopes (1938 : 556) referred to 'exemplar holotypo (macho) de *W. formosensis* Towns., proveniente de Anping', and this statement might qualify for lectotype fixation if it could be shown conclusively that Townsend's (1938) statement did not fix the lectotype and that the Anping male specimen is the single original male syntype that Townsend described. (It is strange that Townsend should have cited a female as 'Ht' both in 1931 and 1938 when he had a male in his original 1927 series.) Hennig (1941 : 186) listed a specimen from Anping as 'Typus' but without even making it clear whether it was a specimen of *formosensis* or of *lobata*.

I conclude from the foregoing account that it is best to consider that no valid lectotype fixation exists either for *lobata* or for *formosensis* and that both nominal species are at present based on syntypes from which a lectotype can be validly designated in future.

MATERIAL EXAMINED. Syntypes of *lobata*: 1 ♂, 1 ♀ [head lost], FORMOSA: Tainan, ii.1909 (*H. Sauter*) (BMNH, by exchange with DEI in 1939).

Rhinomorinia longifacies Herting

Rhinomorinia longifacies Herting, 1966 : 451. Holotype ♂, NEPAL (BMNH) [examined].

This species is closely allied to the European species of *Rhinomorinia* and should probably be regarded as a Palaearctic element in the Oriental fauna. As only the holotype from Nepal is known nothing can be said further on this. Herting's original description is very detailed and needs no amplification.

MATERIAL EXAMINED. Holotype ♂, NEPAL: East Nepal, Taplejung District, between Sangu and Tamrang, 1700 m [5500 ft], 20.x.1961 (*R. L. Coe*) (BMNH). (The holotype was collected on mossy ground under bushes by a hill stream.)

Stevenia ceylanica (Townsend) **comb. n.**

Eophyto ceylanica Townsend, 1919 : 164. Holotype ♀, CEYLON (USNM) [examined].

This is the type-species of Townsend's (1919) monotypic genus *Eophyto*, which in the present work (see p. 48) is newly synonymized with *Stevenia*. Only the female holotype is known. Townsend's description of this is very brief and omits several characters important for comparison with other species. The following descriptive notes are therefore given to augment Townsend's description.

♀. Head with one pair of proclinate orbital setae, without outer vertical setae, with a pair of very small reclinate setae anterior to the prevertical setae. Ocellar setae undeveloped. Eyes rather rounded in profile, upper occiput slightly swollen. Vibrissal angles very weak, much less prominent than profrons. Epistome in the plane of the face. Parafacial setae consisting of a row of four or five setae fairly regularly spaced up whole parafacial height. Pollinosity of lower parts of parafrontals with a conspicuously shifting appearance seen from different angles. Antennae brownish basally and dark brown on apical two-thirds of third segments, pale orange on about basal third of third segments. Arista very fine and more or less bare. *Prst acr* setae almost undifferentiated, *pra* seta absent. Pteropleural seta very weak, two *stpl* setae. Fore tibia with two *pd* setae, but without *pd* preapical seta. Mid tibia with two *ad* setae. Hind tibia with two *ad* setae, two small *av* setae, with *pv* apical seta. Wing with veins mainly yellow on proximal half and brown on distal half, membrane with brown infuscation near costal margin at apices of *Sc* and R_1 and before apex of R_{2+3}, and along the veins of the distal half (especially *m–cu* and M_1); basicosta pale yellow; calyptrae pale yellowish; halteres yellow. Petiole of cell R_5 extremely long, exceeding length of *m–cu*; *m–cu* right-angular in relation to *M*, closer to *r–m* than to bend, the bend *very* abrupt and right-angular; *m–cu* slightly outwardly oblique. Setulae of vein R_{4+5} confined to basal node; costal spine small and fine, about as long as *r–m*. Abdominal T1+2 with median marginal setae, T3 and T4 without discal setae; tergites 3–5 each with a narrow basal band of whitish pollinosity. Body length 4·5 mm, wing length 3·9 mm.

MATERIAL EXAMINED. Holotype ♀, CEYLON: Peradeniya, 3.vi.1914 (*A. Rutherford*) (USNM). (The data label on the holotype does not state the collector's name and this information is taken from Townsend's description.)

Termitoloemus marshalli Baranov

Termitoloemus marshalli Baranov, 1936 : 647. Holotype ♂, INDIA (BMNH) [examined].

This extraordinary calyptrate fly, still known only from the original holotype and two paratypes, may be incorrectly placed in the Rhinophoridae but appears to fit better there than in the Calliphoridae where it was originally described. The head is particularly unusual and has the oral fossa extremely large to accommodate a short but greatly enlarged and boat-shaped mentum of the proboscis, and the palpi are greatly expanded, flattened and rather leaf-like with exceptionally stiff spinous setae. The type-material was apparently collected whilst predatory on worker termites, and the strange palpi and gross proboscis are presumably adaptations for locating and consuming the prey. Because of the predaceous habit Baranov thought that the affinities of *T. marshalli* (the only species of *Termitoloemus* Baranov, *op. cit.*) might lie with *Bengalia* Robineau-Desvoidy, a calliphorid genus well known to be predaceous on ants: but apart from some, presumably convergent, resemblance between the proboscis of *Termitoloemus* and that of *Bengalia* there is no resemblance, and Sabrosky & Crosskey (1970) suggested that *T. marshalli* should be referred to the Rhinophoridae rather than the Calliphoridae. This placement is followed here, but it is emphasized that further knowledge of the biology might not support the assignment to Rhinophoridae (and, indeed, the predaceous habit is not one found elsewhere in the family to my knowledge).

Description of *T. marshalli* is not needed here as it can be easily identified from the key given above, Baranov's original description (in German) is extremely detailed, and Senior-White *et al.* (1940) have given a comprehensive English description. A few points may be noted, however, about the slide-mount of the holotype genitalia (in BMNH): the slide shows that the cerci are extremely reduced, the surstyli long and very narrow (but both broken and with missing apices), and the ejaculatory sclerite of an extraordinary umbrella-like or mushroom-like shape (different from that of other rhinophorids).

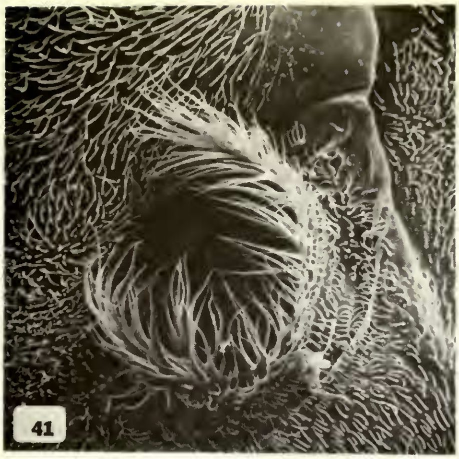
MATERIAL EXAMINED. Holotype ♂, INDIA: Uttar Pradesh, Kanpur [=Cawnpore], 3.ii.1935 (*H. N. Sharma*) (BMNH).

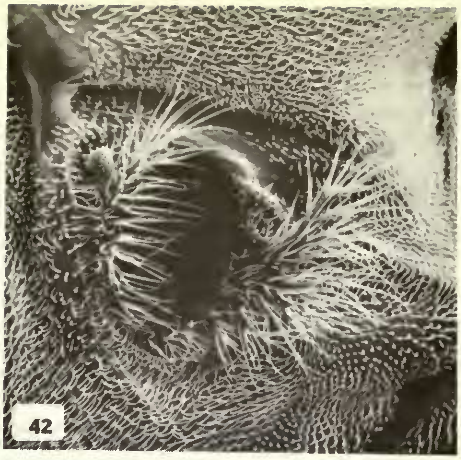
Paratypes. 2 ♀, data and depository as for holotype.

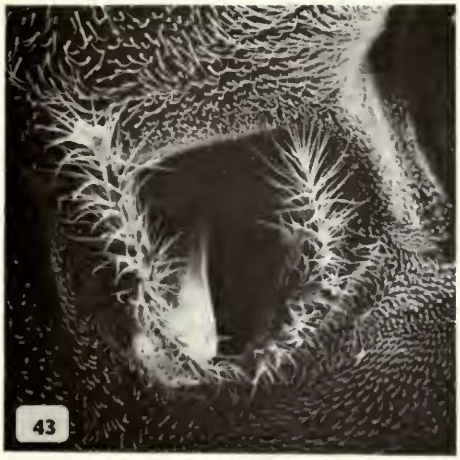
A note on the genus *Morinia* Robineau-Desvoidy in the Oriental Region

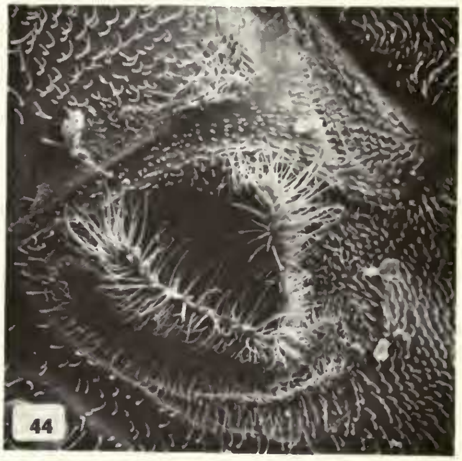
Since preparing the Rhinophoridae section for *A catalog of the Diptera of the Oriental Region* (Delfinado & Hardy, eds, in press) I have come upon two pieces of information suggesting that the genus *Morinia* occurs in the Oriental Region, in addition to the four genera mentioned above and in Crosskey (in press). Details are as follows.

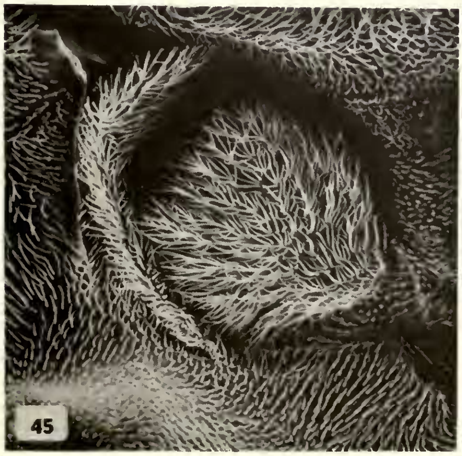
(1) The BMNH collection contains a female paratype of *Idiopsis argenticincta* Senior-White, this being the specimen that Senior-White (1923 : 49) recorded in the original description as being in his own collection. This specimen (despite its very bad condition) can be seen immediately not to belong either in the genus *Idiopsis* Brauer & Bergenstamm in which it was originally described, or in the genus *Pollenia* Robineau-Desvoidy, in which Senior-White *et al.* (1940 : 125) subsequently placed it. In fact this paratype is not a calliphorid at all, but obviously


41


42


43


44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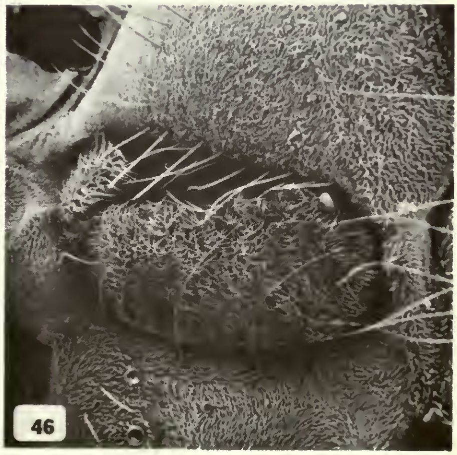
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Figs 41–46 Stereoscan photographs of the left metathoracic spiracle of some Rhinophoridae compared with a tachinid and a calliphorid. (41) *Rhinophora lepida* (Meigen) (Rhinophoridae). (42) *Phyto discrepans* Pandellé (Rhinophoridae). (43) *Stevenia atramentaria* (Meigen) (Rhinophoridae). (44) *Melanophora roralis* (Linnaeus) (Rhinophoridae). (45) *Peribaea orbata* (Wiedemann) (Tachinidae). (46) *Phumosia lutescens* (Villeneuve) (Calliphoridae).

belongs in or close to the rhinophorid genus *Morinia* and is seemingly very near the European species *M. melanoptera* (Fallén) (though differing noticeably by possessing a broad fascia of silvery grey pollinosity on the posterior half of the prescutum). In all probability, therefore, *argenticincta* is a valid Indian species of *Morinia*. Definite assignment to, and combination of name with, *Morinia* cannot be made at present, however, because it is not possible to establish that the BMNH female paratype is conspecific with the male holotype of *argenticincta* from Simla, and there is a real possibility that Senior-White's original description confused two species. I have not attempted to locate the male holotype as it has not been sufficiently relevant for this paper, but even Senior-White was doubtful where it was deposited, remarking '*Type* in Imperial Agricultural Institute, Delhi?' (Senior-White *et al.*, 1940 : 125). If the holotype can be found it should be possible to confirm its suspected identity as that of a *Morinia* species. The data of the BMNH paratype are: ♀, INDIA: Uttar Pradesh, Kumaon, Muktesar, 2300 m [7500 ft], ix.1922 (*Fletcher*).

(2) Hennig (1941 : 186), in his catalogue of Formosan Diptera, listed a specimen from Chip Chip in the Deutsches Entomologisches Institut identified by Villeneuve as *Morinia melanoptera* (Fallén). The specimen has not been seen, but it seems unlikely that it was correctly identified. Herting (1961 : 9) does not mention Formosa under the distribution of *M. melanoptera*. On the other hand, it is possible that the Chip Chip specimen belongs to Senior-White's species '*Idiopsis*' *argenticincta*, which (as mentioned above) is most likely a *Morinia*.

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